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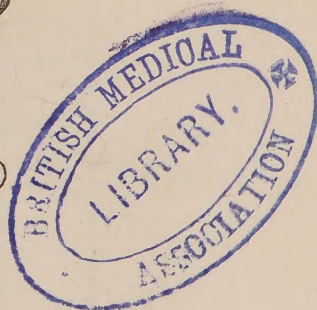
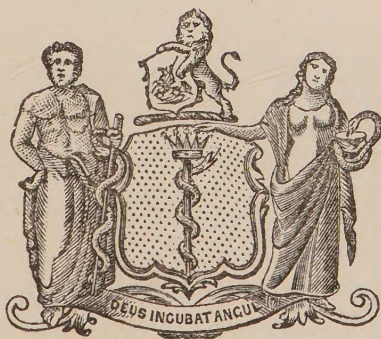
EDITED BY

JOHN W. OGLE, M.D. F.R.C.P.

AND

TIMOTHY HOLMES, F.R.C.S.

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ST. GEORGE'S HOSPITAL REPORTS.

I. ON THE TREATMENT OF RHEUMATIC FEVER.

A CLINICAL LECTURE.

WHICH is the best method of treating rheumatic fever? This is a question which is frequently asked, and which you who have watched my management of the cases admitted into this hospital would, I doubt not, answer in a decided manner. Nevertheless there are persons who question the superiority of the "alkaline" over other methods of treatment, and not a few who deny the efficacy of any drug, or combination of drugs, in either mitigating the severity, averting the danger, or shortening the duration of the disease. I propose therefore to illustrate the treatment I ordinarily pursue by reference to the case of George Stuart, æt. 22, who was under my care in the Hope ward, and refer to the hospital registers for evidence as to the result of that treatment in an extended series of cases. I will then briefly remark upon other plans of treatment which have been proposed, and will point out the causes which have led, and doubtless will still lead, a certain class of practitioners to fail in subduing the disease, and in averting the danger of heart-complications, whether by the use of alkalies or any other method of treatment.

G. S., a groom, æt. 22, was admitted into the Hope ward on the 18th of May. He had suffered from rheumatic fever a twelvemonth previously, and was under treatment for a period of six weeks. The present attack commenced, a week before his admission, with shivering, followed by wandering pains in the limbs, and inflammation and swelling of several of the larger joints, which at the date of his admission were red, swollen, and exquisitely painful. The heart's sounds were

clear and its rhythm was normal; the skin was hot and perspiring profusely, the perspiration being intensely acid; the pulse 118, regular, and of good strength; tongue thickly furred and red at the tip and edges; bowels costive; urine scanty and turbid, with a copious deposit of lithates. He was ordered ten grains of colocynth and calomel pill immediately, and the following draught every four hours, viz. soda bicarb. ʒjss., potassæ acetatis ʒss., haustûs acetatis ammoniæ ʒij., to be taken in a state of effervescence, with half a drachm of citric acid dissolved in an ounce and a half of water. His food was restricted to beef-tea. On the following day the urine had become clear and alkaline, and the pains were somewhat easier; the draught therefore was repeated only three times in the twenty-four hours. On the 20th the urine was still alkaline, the pulse had fallen to 80, the pains had greatly subsided, and he had slept at intervals throughout the night. On the 24th very little pain remained, and as the urine was decidedly alkaline the following draught was substituted for that already given, viz. potassæ bicarbonatis ʒss., haustus cinchonæ ʒjss. ter die. On the 26th he was quite free from pain, and was up and about the ward; and as he complained of being hungry, an egg was given in addition to the beef-tea. On the 30th he remained free from pain, and the urine was still alkaline; fifteen grains of the potash were therefore omitted, and he was allowed the "ordinary diet" of the hospital. On the 1st of June he had been a week free from pain, and he was therefore permitted to leave the hospital.

Those of you who have watched the progress of the disease in this particular instance, and have noted in other cases under my care how readily the symptoms subside, and how rarely complications arise when the alkaline treatment is properly carried out, may find it difficult to comprehend how formidable rheumatic fever was formerly regarded—nay, even now is regarded by many practitioners—and in how large a proportion of cases dangerous, or even fatal, complications were met with. But the treatment of rheumatic fever has undergone a marvellous change during the last fifteen years, and perhaps there is no greater proof of the efficacy of modern treatment, no more complete answer to the dangerous folly of modern scepticism as to the efficacy of drugs, than the smallness of the risk incurred in the present day by a patient who is properly treated for rheumatic fever, and the comparatively short time during which he is incapacitated by the disease.

Formerly, as you will find by referring to our Hospital Case-books, the patient was bled, and the bleeding was followed by full doses of guaiacum and opium: or a hot-air bath

was given, and this was followed by salines with tartarised antimony, nitrate of potash, iodide of potassium, or colchicum wine : or pills containing calomel and opium were administered at intervals of four or six hours, until salivation was produced, the bowels meanwhile being strongly purged on alternate mornings by a senna draught. In some instances the bleeding or the hot-air bath was repeated ; in others the opium, nitre, colchicum, or tartarised antimony was prescribed in larger doses than usual ; and in others again, lemon-juice in half-ounce or ounce doses was given at short intervals almost to the exclusion of other remedies. The result, however, differed very slightly, whatever the form of treatment adopted, for none of these methods appeared to exercise the slightest influence over the course of the disease. Little or no relief from suffering was obtained within three weeks from the beginning of the attack, and the patient was seldom free from pain, and in a condition to leave the hospital under a month or five weeks from the time he came under treatment. Moreover, the heart became implicated to a greater or less degree, and permanently damaged in one out of every three cases. Let me take the statistics of St. George's as our guide. During the time I held the office of Medical Registrar, namely from January 1st, 1845, to May 1st, 1848, 246 cases of acute rheumatism were admitted into St. George's Hospital, and they remained in the hospital on the average thirty-five days ; of these 246 patients, 119, or 1 in every 2.06, had some form of recent affection of the heart ; and 1 in every 6.3 had pericarditis. During the six years ending December 31st, 1850, 17 cases, or about 1 out of every 27 cases of rheumatic fever admitted into the hospital, terminated fatally.

These facts you will find tabulated in my work on rheumatism. They correspond very closely with the results obtained by M. Bouillaud in France, and by Dr. Latham, Dr. John Taylor, Dr. Macleod, Dr. William Budd, Dr. Basham, and other hospital physicians in this country, and may be taken to represent with tolerable accuracy the average result of the treatment of rheumatic fever up to the year 1852. It was then that, in my work on Rheumatism, I drew attention to the value of full and repeated doses of alkalies in

the treatment of that disorder; and the results of that plan of combating the disease present a remarkable contrast to those just referred to. I have submitted 417 cases of rheumatic fever to the alkaline treatment in hospital and private practice; the disease has not proved fatal in a single instance; in nine cases only, or in little more than 2 per cent, has any cardiac complication occurred while the patient was under my care, and even these, for the reasons below assigned,* can hardly be regarded as consequent on failure of the remedies; the disease has been arrested, and the patient has been out of bed in many instances within a week from the commencement of treatment, and in ninety-four consecutive cases which were tabulated with a view to this inquiry, the average duration of the disorder, after the commencement of treatment, was only eleven days—in other words, the patient reported himself free from pain and was up and dressed at the expiration of eleven days. The Hospital Register of my cases tells a very similar tale, though the figures are necessarily somewhat different, because, with a view to guard against relapse, the patients are kept in hospital for a week or ten days after cessation of their pains. I have gone over my case-books and the Hospital Register for five years, beginning with the 1st of January 1860, and terminating on December 31st, 1865, during which period I find that 116 cases of rheumatic fever were admitted under my care. Excluding eighteen cases in which pericarditis existed at the time of the patients' admission, the average term during which the patients remained in hospital was only 20·1 days, which gives about 11 or 12 days as the average duration of the disease; and even including the cases of pericarditis, the average stay in hospital was only 22·2 days—a result which, I believe, has never before been attained.

In order that you may not misapprehend the nature of

* In three of these nine cases pericarditis occurred, and in six endocarditis; but in one of the former, and in five of the latter, the murmur was discovered within twenty-four hours after the commencement of treatment. It is possible, therefore, that the mischief may have existed in an incipient state, though it escaped detection when the patient was first seen; and at all events it is obvious that it must have commenced before the remedies could have taken effect. In one of the cases of pericarditis the patient had been up and about the ward for a week, and had ceased to take alkalies for some days, when a relapse took place, with pericarditis as its earliest symptom.

the alkaline treatment, I will briefly describe its object, and the means by which it can best be carried out.

The term "alkaline treatment," as I would have you understand it, implies not merely the administration of salines and small doses of alkalies, but the exhibition of alkalies or the neutral salts in full and repeated doses—in doses adequate to produce alkalinity of the urine, if possible, within twenty-four hours. Whether it be that the skin and kidneys form the channels by which the poison of rheumatism is usually eliminated, and that the condition of their secretions affords an index to the amount of the rheumatic element in the blood, most certain it is that in rheumatic fever the urine is usually intensely acid and loaded with lithates, and the perspiration profuse, sour-smelling, and acid to a degree not met with in other disorders; and that so long as this condition of the secretions continues, the temperature of the body and the pulse keep up, the pains persist, and the heart is liable to become affected. It is equally certain that as soon as this extraordinary acidity is counteracted, as shown by alkalinity of the urine and a decrease in the acidity and profuseness of the perspiration, the pulse and the temperature of the body fall, the pains diminish, and the heart may be regarded as safe from attack.

I will not stop to inquire whether there is trustworthy evidence of a distinct rheumatic element in the blood—an acid material which alkalies may neutralise and counteract—or whether the whole train of symptoms observed in rheumatic fever may not be referable to perverted nervous action and consequent local disturbance of nutrition. The disease is certainly attributable to malassimilation, and my impression is that the nerves play a far more important part in its causation than is commonly supposed. Probably we should not be far from the truth if we were to say that rheumatic fever is due to the presence of an acid product of a peculiar form of malassimilation which frequently originates in disturbance of the nervous system. Practically, however, it matters very little

Another was an example in which the urine became alkaline within a few hours, and the dose of the alkalies was injudiciously reduced to a minimum, although the perspiration remained profuse and acid as before.

what theory you adopt: the indications for treatment are clear and intelligible, and must remain unaffected by any theory. They are simply these—to restore the normal condition of the urinary and cutaneous secretions, to promote the elimination of the rheumatic element by keeping up a free action of the bowels, and meanwhile to tranquillise the patient's irritability and mitigate his sufferings. You may naturally imagine that the last two indications are infinitely the most important; and that if the pain could be subdued and the patient's irritability tranquillised by sedatives, the disease would gradually subside and the secretions reassume their healthy character. But a serious, nay an insuperable, difficulty is encountered when an attempt is made to carry this theory into practice. Opium, the best of all the sedatives and the only one which proves of any service in counteracting the agonising pain of acute rheumatism, is found to be a very unsafe drug, and cannot be trusted to in combating this disease. If given in quantity sufficient to subdue the pain and tranquillise the excited state of the nervous system, it checks secretion and tends to increase and perpetuate the acidity, on the existence of which the disease depends. It may, in some degree, mitigate the patient's pain, but it will certainly prolong the term of his suffering, and expose him unnecessarily to the very grave risk of inflammation of the heart. To what an extent this risk is incurred under the use of opium may be seen by reference to a report of cases treated by Dr. Sibson in St. Mary's Hospital,* from which it appears that out of twenty-six cases treated principally by opium, no less than twenty had affection of the heart, and that in fourteen, or more than half of these, the heart became implicated after the patient's admission into the hospital. Moreover, the average duration of the disease under this treatment was no less than 30·6 days.

Well then, if the disease cannot be overcome by sedatives—in other words, if opium will not arrest it, cannot be safely trusted to even to relieve the patient's sufferings, and does not fulfil any of the most strongly-marked indications for treatment—what other means can be resorted to with a prospect of success? Obviously, if there is no direct method

* See *British Medical Journal* for Dec. 5, 1857.

of subduing the pain and tranquillising the nervous system, we can only hope to accomplish our object by addressing ourselves to the relief of the disease, assured that if its cause can be removed, the pain and other symptoms to which it gives rise will speedily subside. The most natural and the safest method of proceeding is by the administration of full doses of alkalies and the neutral salts. Not only do they fulfil most of the indications for treatment already referred to, such as the restoration of the normal condition of the urinary and cutaneous secretions, but they tend to the elimination of the rheumatic element by favouring the metamorphosis of tissue and increasing the activity of the kidneys and bowels; at the same time they guard against one of the most serious complications of the disorder by augmenting the solubility of the fibrin of the blood, and thereby rendering its deposition on the valves of the heart less probable. Those of you who have watched my practice in the wards are aware that this is no fanciful picture; for however severe a case of rheumatic fever may be on admission, however loaded and scanty the urine, however profuse and acid the perspiration, the urine has usually become neutral or even alkaline within twenty-four or forty-eight hours, its quantity has increased, and its specific gravity, in some instances, has even risen, the perspiration has become less acid and less profuse, and throughout the attack the heart has all but uniformly remained free from organic murmur. And to show that this altered condition of the secretions is accompanied by a great diminution of pain and by a corresponding decrease in the intensity of the disease, I may mention that in the great majority of cases the patient obtains sleep within forty-eight hours without the aid of opiates.

But you may fairly ask, Are there no other means by which the same result may be brought about? I believe there are none which operate so certainly, so safely, and with so little distress to the patient; and with one exception—I refer to the blister-treatment as pursued by my friend Dr. Herbert Davies—I believe that no other method of treatment at present known has the slightest influence in shortening the duration and mitigating the danger of rheumatic fever. The blister-treatment, however, deserves a passing notice. What-

ever the rationale of its action, there cannot be a doubt that it fulfils in some degree the indications for treatment which I have already pointed out. It renders the urine alkaline, probably by the shock which it produces and the drain to which it gives rise; and it also seems, in some instances, to shorten the duration of the disease. But I have seen and heard enough of it to know that it cannot be trusted to for the protection of the heart, and that the indiscriminate and extensive blistering of the inflamed joints, which constitutes its very essence, is often productive of excessive pain, and may not be unattended by danger. Not only may it give rise to troublesome sloughs, which weaken the patient, aggravate his suffering, and protract his convalescence, but his life may be endangered by pyæmia, resulting, as in burns, from the extensive damage sustained by the surface of the body. That this source of danger is not imaginary you may see by reference to No. 40 in our Hospital Post-mortem and Case-book for 1866, where you will find the details of the case of Fred. Baily, in which this unfortunate complication occurred, and led to the forfeiture of the patient's life.

It is needless, then, to detain you any longer by an examination of a mode of treatment which, to say the least, is less certain, less safe, less satisfactory in its results, and at the same time infinitely more distressing to the patient, than the alkaline method which I am in the habit of pursuing. I will, therefore, proceed to give you full directions for carrying the alkaline treatment into effect. And first as to the alkali and neutral salts which should be selected, and the dose in which they should be given. Practically it matters little whether soda or potash be given, or whether the alkali be free or combined with any of the vegetable acids; but ammonia and its salts do not fulfil the indications for treatment so often referred to, and fail to exercise any influence over the course of the disease. Experimentally I have given a solution of $\mathfrak{z}\text{ij}$. of carbonate of ammonia every three hours, rendered effervescent by the addition of $\mathfrak{z}\text{ss}$. of citric acid; and I have continued this treatment for eight consecutive days without any apparent result beyond that of rendering the pulse rapid and weak, and ultimately causing the patient to vomit; the urine remained intensely acid, and usually loaded as at first;

the perspiration quite as sour and profuse, and the rheumatic pains just as severe.* But I have repeatedly tried the experiment of giving soda alone and potash alone; I have given the carbonates of each alkali alone, and the neutral salts of each alkali alone; and I have also given both the free and the neutral salts in every variety of combination. The only difference I have been able to discover between these various methods of medication is that the stomach is usually more tolerant of the remedies in their neutral form than when they are uncombined, and that to some persons potash proves less nauseous than soda; but inasmuch as when the stomach is unduly acid a free alkali will accomplish what a neutral salt will not, and inasmuch also as soda forms an important element of the blood, and may be fairly presumed to induce certain changes which would be imperfectly effected by potash alone, my usual practice is to combine the two alkalies, giving a certain proportion of both in the form of neutral salt, but adding a few grains of the carbonate of one or other of them in a free state. A favourite formula is the following, viz. $\mathfrak{zss.}$ or $\mathfrak{vij.}$ of the acetate of potash together with $\mathfrak{zjss.}$ of carbonate of soda dissolved in $\mathfrak{z}ijj.$ or $\mathfrak{z}jv.$ of water, rendered effervescent by the addition of $\mathfrak{zss.}$ or $\mathfrak{vij.}$ of citric acid, or $\mathfrak{z}j.$ or $\mathfrak{zjss.}$ of lemon-juice.† The result is the administration of acetate of potash and citrate of soda with about $\mathfrak{zss.}$ of uncombined carbonate of soda. In most cases this draught is well borne by the stomach, and if repeated every four hours will render the urine alkaline within twenty-four hours; but in severe cases it may be necessary to give it every three hours, for if administered less frequently the urine will sometimes remain acid until after the lapse of thirty-six or even of forty-eight hours, and thus the heart will be exposed for so much longer to the risk of inflammation. In exceptional cases the amount of acid formed is such as to resist the effect of these doses of alkalies for three or even four days, but experience has taught me that this happens only when the liver and bowels are sluggish; therefore whenever I find

* The case was that of Sarah Rolfe, æt. 48, who was admitted on Oct. 18, 1861.

† If the bowels are torpid, I vary the form of this draught by prescribing $\mathfrak{zss.}$ or $\mathfrak{vij.}$ of potass. tartrate of soda instead of the acetate of potash, and tartaric acid instead of the citric acid.

the tongue furred and yellow, and the urine acid after the alkalies have been administered for forty-eight hours, it is my practice to administer three grains of calomel—guarded by opium if the bowels are loose—or in combination with colocynth if the alvine discharges are scanty and deficient;* and in either case the urine commonly becomes alkaline directly a free secretion from the bowels has been set up.

As soon as the urine has been rendered alkaline, whether at the end of the first, second, or third day of treatment, the alkaline draught is repeated every six hours only; and if on the following day it still retains its alkalinity, the medicine is given twice only in the twenty-four hours. If that dose suffices to keep the water alkaline for two days more, quinine or bark is given in combination with half or less than half of the alkali contained in the former draught;† and as the tongue clears and the symptoms subside the quantity of the alkali is cautiously diminished until a simple quinine draught is taken. Meanwhile, when the tongue has cleared satisfactorily, a little fish or meat is allowed in addition to the beef-tea or broth to which the diet had been hitherto restricted.

Such is the treatment I would have you pursue in rheumatic fever. Its success is sufficiently attested by its results. A bath of any kind is seldom needed, and never unless the skin be very dry, when a hot-air bath may be administered; opium is rarely, very rarely, had recourse to,—never except under conditions of extreme or unusual restlessness and excitement, or when the bowels are relaxed, and then only in aid of the other remedies. Blistering is not prescribed, unless, which rarely happens, the inflammation fixes itself so long in any joint, that the integrity of that joint appears to be in danger; and if “bedding in blankets” is ever resorted to, the attendants are forbidden to heap on extra blankets, which overheat the patient, and tend to exhaust him by keeping up perspiration after all necessity for profuse sweating has ceased.

* In this case it is often prudent to repeat the dose of calomel on alternate nights until three or more doses have been taken; for no amount of alkali will subdue the disease so long as the liver remains inactive.

† The quinine given in effervescence as follows is not unpalatable: Quiniæ sulph. gr. ij., acidi citrici ℥j., syrupi limonis ℥ij., tincturæ aurantii ℥ss., aquæ ad ℥iij.; ft. haustus, ter die sumendus, cum potassæ bicarbonatis ℥ij.

I am so anxious that you should thoroughly understand the objects aimed at in the treatment recommended, that, at the risk of being tedious, I will even revert to and comment on its salient features.

The first object is to alkalinise the system as *speedily as possible*, with the view of obviating inflammation of the heart. This can usually be accomplished in twenty-four hours if alkalies are given in sufficient quantity; and inasmuch as alkalies do not cause depression, so long as the urine remains acid, they may be given to any amount which the stomach will tolerate until alkalinity of the urine has been produced. In order to prevent their rejection by the stomach, it is advisable to give them in a state of effervescence; and with a view to facilitate their absorption, it is expedient to dilute them largely with water.

Secondly, as soon as the urine when freshly voided* shows an alkaline reaction, the quantity of alkali should be reduced to the lowest limit which is consistent with the safety of the patient—to the point of just keeping the urine neutral or slightly alkaline—for alkalies administered in large doses and at short intervals when the urine is alkaline, are apt to prove extremely depressing; and from what I observed in two cases to which I was called in consultation in private practice, in which potash had been so administered for many days prior to my seeing the patients, I am inclined to think they may even prove fatal to life. Assuredly if given beyond the necessities of the case they retard rather than accelerate the patient's recovery.

Thirdly, my aim being to carry the patient through his attack with the least possible loss of strength, and to restore the tone of the system as soon as circumstances will admit, I combine quinine or bark with the alkali as soon as it is found that two doses of the alkaline mixture in twenty-four hours suffice to keep the urine alkaline—a fact which proves that the force of the disease is broken. This point is usually reached about the fourth, fifth, or sixth day.

* In practice I find that mistakes are constantly made in consequence of the urine not being tested until some hours after it has been voided, when, in hot weather especially, it often becomes alkaline from decomposition. The urine should always be examined within an hour after it is passed.

Fourthly, it being most important to prevent the recurrence of malassimilation, and so to obviate a recrudescence of the disease, the diet should be restricted to broth or beef-tea until after the tongue has fairly cleaned. If the patient is weak, a little brandy-and-water may be taken, though practically I find that it is seldom needed, and feel sure that in most instances it retards recovery, and that the patient is better without it. But the desire for solid food returns long before the power to digest it, and there is nothing of which I am more convinced than that improper alimentation during the progress of the disease is the most common cause in private practice of its protracted duration; and that whether in private or hospital practice, a piece of meat taken a day before the tongue has cleaned and the stomach is in a condition to digest it, not unfrequently proves the cause of a serious relapse. I have so often tried this experimentally in the wards, for your especial behoof, that there can be few of you who have not had the opportunity of satisfying yourselves on this point from actual experience.

It may naturally occur to you to ask how it happens that so much doubt is often expressed as to the value and efficacy of the alkaline treatment, if its results are so satisfactory and so easily attained? The causes, I believe, are not difficult to point out. The failure of alkalies to relieve the patient's symptoms lies, of course, at the bottom of the doubt; but in every case which I have seen, the cause of failure has been clear and unmistakable. Either there has been an error in diagnosis, whereby an acute attack of osteo-arthritis or of gonorrhœal rheumatism has been mistaken for an attack of rheumatic fever—a very common source of failure; or the grounds on which the alkaline treatment is based have been imperfectly appreciated, so that the remedies have been administered in small doses which are utterly powerless to control the disease—a still more common source of failure; or alkalies have been pushed beyond the exigencies of the case, so that intense alkalescence of the urine has been kept up at a time when bark or quinine was needed; or the liver has been torpid, and the bowels much deranged, and no step has been taken to remedy this disorder; or an improper alimentation has been permitted throughout the attack, so that any

good which might have been effected by the remedies has been counteracted by the imperfect assimilation of the food which the patient has taken; or, lastly, the cases have been exceptional examples of the disease, in which alkalies are ill borne, and run off by the bowels, notwithstanding any efforts to control their purgative action,—cases in which no alkaline action can be induced, and in which perforce we must be content with blistering, or some other plan of management. I can truly say that I have never been called to see a case in which the alkaline treatment has been said to have failed without discovering one or other of these causes for its failure, and in which—except when there has been a mistake in diagnosis, or when the alkalies have proved aperient and run off by the bowels—the symptoms have not speedily subsided as soon as the alkaline treatment has been properly carried out.

HENRY WILLIAM FULLER, M.D.

II. CASES OF DELIRIUM

PROBABLY DEPENDENT ON IMPOVERISHMENT OF THE BLOOD.

CONSIDERABLE interest attaches to the causation of delirium, both in its acute and chronic forms; and any case which tends to throw light on a subject of such obscurity seems worthy of record. In former days, delirium, however produced, was invariably regarded as evidence of brain-fever. Abercrombie did not know delirium tremens as anything but "an obscure form of inflammation of the brain." At a more recent date the delirium of typhus was still regarded by some physicians as an indication for the use of the lancet; and for many years after so baneful a practice was abandoned, it was still thought unadvisable to administer opiates, lest the action of the drug should increase the congestion of the brain which was believed to exist.

Such hypotheses have, it is true, been long on the decline, and the more advanced pathologists had entirely repudiated them before they quite ceased to modify treatment. On the other hand, the knowledge which has been obtained at a comparatively recent date of the frequent presence of pericarditis during the existence of acute rheumatism, led not unnaturally to the conclusion that as the friction-murmur in the chest was to be taken as an indication of inflammation of the pericardium, delirium in that disease served as an evidence that inflammatory action was going on in the membranes of the brain. This seemed to be only a fair deduction from its previously-ascertained pathology and the distribution of parts within the cranium. In rheumatic fever the fibrous tissues seem to be especially liable to inflammatory action when united to serous membrane, such as the synovial membranes of the joints, or the serous membrane covering the heart. In the brain there is just such a relation of parts; and it seemed not irrational to conclude that when delirium set in, which is one

among many of the indications of acute arachnitis, its cause would be found in a similar inflammation to that which had been so often traced in rheumatic pericarditis. Unfortunately the hypothesis was not borne out by fact; and this was first brought home to my own mind by a case which occurred in St. George's Hospital many years ago. A patient, admitted with a severe attack of rheumatic fever, was seized with delirium on the fifteenth day of her illness, which increased in violence the following day, and terminated in fatal coma in about forty-eight hours. The post-mortem examination showed that there was no inflammation of the brain. The case presents so many features of interest, that it seems worthy to be recorded here in detail, though I have given elsewhere* a short abstract of its principal features with reference to other points connected with the pathology of rheumatic fever.

CASE I.—S. A., æt. 21, admitted into Crayle ward on the 24th of January 1850. She was reported to have been first attacked with pains in her joints on the 17th inst., and to have been under treatment since the 19th. She stated that she had previously experienced a slight attack of rheumatism in the right shoulder, but had not been otherwise subject to it. When admitted she presented the ordinary symptoms of acute rheumatism of rather severe type. The joints were swollen, red, and tender, pulse quick, tongue furred, face flushed; she complained of some catching in her breathing, but no bruit accompanied the heart's action. She was put on calomel and opium and nitre-draughts for two days; and on the 26th, the pain in the chest having subsided and the breathing being quite free, she was directed to continue the calomel at night only with one grain of opium, and to use the hot-air bath; a senna draught being given occasionally. Her face was remarkably suffused, the perspiration acid and abundant, the chest being covered with miliarial vesicles. The stethoscope only indicated a slight roughness accompanying the first sound of the heart. On the 28th a distinct bruit was heard at the base of the heart during the systole. Her general symptoms had improved, the tongue was cleaner, and the joints less inflamed; the calomel was left off, the vapour-baths continued, and morphia given at night. For the next three or four days everything seemed to go on favourably, except that nurse reported her as wandering a little at night on the 31st and the 1st February.

Next morning she was observed to have so much tremor in her movements and excitement of manner, as to suggest the possibility of her having been a person of dissipated habits, but the suspicion was ascertained to be perfectly groundless. Twenty minims of laudanum were given at bedtime, after which she fell into a disturbed sleep for an

* *Medico-Chirurgical Transactions*, vol. xxxv. pp. 3, 4.

hour or two, waking in a more excited state, when a second dose was administered. After this she became so violent that she had to be held in bed by force, and was subsequently removed from the ward. Her face wore a dusky hue, and her breathing was much oppressed. An ether draught was administered, and sinapisms applied to the chest. She then became quieter, and gradually sunk into a state of coma, in which she died. About an hour before death six ounces of blood were drawn from the arm which presented none of the buffy appearance usual in rheumatic fever.

Post-mortem examination (twenty-nine hours after death).—Body stout and well-made. Brain and membranes rather drier than natural, otherwise healthy. Lungs congested; a small amount of serum in each pleura, and a few old adhesions on the right side. Pericardium contained about two ounces of rather turbid serum. Heart and valves perfectly healthy. Fibrinous coagula in right cavities. Peritoneum contained a small quantity of turbid serum. Spleen soft and flabby; kidneys slightly congested; all other organs healthy. Uterus highly vascular in its interior; purulent fluid flowing from the os. Vagina healthy. Knee-joints contained each about two drachms of slightly turbid yellow fluid, in which floated a mass of coagulated lymph. Synovial membrane highly vascular. Cartilages perfectly clear and white. Right elbow-joint presented no appearance of disease.

Preconceived ideas were here entirely overturned by the testimony of fact. The development of inflammation in the brain which had been looked for was found to have no existence. And while the presence of fibrinous coagula of considerable size in the knee-joints proved the intensity of the action going on in them, and the effusion of a small amount of turbid serum into the pericardial and peritoneal sacs afforded evidence of a tendency at least to internal inflammation, the absolute freedom from congestion or effusion of any sort within the cranium proves that there really was no trace of arachnitis to explain the delirium, and that its cause must be sought elsewhere. Viewed in the light of the post-mortem examination, it is not difficult to observe that in the tremulous movements which accompanied the delirium an indication was given which did not receive due attention at the time, but was nevertheless of very considerable value, as showing that the affection of the brain was not of an inflammatory character. It placed it in the same category as typhus and delirium tremens, in which, notwithstanding the delirium, stimulants are often urgently called for. The gradual deterioration of the blood, which was so marked as to make itself heard in a murmur at

the base of the heart, if the sound could have been read aright, and its meaning correctly interpreted, would have led to the same conclusion. Subsequent experience has fully justified the conclusion which I then drew, that if it were possible to have saved that poor girl's life in any way, it could only have been by disregarding the rheumatism altogether, and having recourse to the free administration of stimulants. To some minds the teaching of such cases has been, that stimulants ought to be administered early in order to ward off any similar danger. It has been held, that if the system be but duly sustained by them, such an occurrence is impossible ; and that therefore their administration is an imperative duty. I cannot subscribe to such a view. To my mind it is certain that stimulants in any form seriously retard convalescence, and greatly increase the severity of the attack. The patient may be quite as fully sustained by other means, without the evil consequences which I am convinced are a necessity of the stimulant plan of treatment ; and it is only when other means fail of their effect, that we are justified in risking such consequences in order to avoid a more pressing evil. The paramount duty of the physician is to watch, and, without following any fixed and undeviating plan, to adapt his resources to the exigencies of the case. There can be no doubt that in a strong and healthy man actual starvation is the very best system of diet in the first stage of the disease ; and it is only necessary to watch that it be not carried too far. On the other hand, among the ill-fed population of large towns nourishment must be given freely from the first, in order to secure a rapid convalescence ; but in my own experience, the administration of stimulants, except in cases of need, has seemed to be almost invariably injurious.

It is quite true that, in acting on such principles, cases of the kind just related may occasionally arise ; but if the circumstances under which they occur are fully understood, and immediate recourse be had to stimulants and abundant nourishment whenever the slightest tendency to the attack is observed, such symptoms need not be regarded as much more serious than many others of those complications which are so constantly seen. If delirium be more frequent under such treatment, pericarditis is certainly much rarer ; convalescence

is more quickly established, and there is less risk, *ceteris paribus*, of a life of lingering cardiac disease when the rheumatism has completely disappeared.

The cause, too, appears to me to be not far to seek. It has often been my lot to observe that the apparent necessity for the administering opiates in this disease, if at all prolonged, was followed by the locking-up of the secretions, the consequent arrest of metamorphosis and elimination of effete tissue, and an aggravation of all the symptoms; and that this state of things has been at once relieved by the omission of the opiate,—a change of treatment which has proved all the more certain and rapid in its action if accompanied by a brisk purgative. It is well known that the great action of alcohol in the system is that of arresting elimination; and it must therefore produce very analogous effects in acute rheumatism to those caused by the undue administration of opiates. To this property I am inclined to attribute the evils resulting from its use. It is quite natural to conclude that wine and beer, as acid-generating substances, would be more prejudicial than spirits; but gin and brandy have, in my experience, had such a marked influence in retarding recovery, that it seems impossible to attribute the deleterious effects produced by alcoholic stimulants to the mere generation of an excess of acid. Indeed, the presence of an excess of acid is but a very small part of the disease which we know as rheumatic fever; and I have had no means of ascertaining whether wine or brandy was most to be avoided in its treatment.

In discussing the subject of the administration of stimulants, it must be remembered that their immediate action on the brain, whether used merely for the purpose of stimulating its flagging energies, or carried so far as to produce inebriation or partial stupor, differs entirely from that more general action which has been shown to result from their continued use, by which the blood becomes spoiled and unfit to maintain healthy vital action alike in the brain and in other organs. This, indeed, is broadly expressed in the difference between delirium tremens and intoxication; the one necessarily the result of an old habit, and likely to occur just in proportion to the extent to which the habit has been indulged—the other produced by recent excess, and most easily developed when

the individual is least accustomed to alcoholic stimulants. In the case of rheumatic fever, the evil to be guarded against is that spoiling of the blood which so often results from the inevitable six or eight ounces of brandy daily, ordered with the view of "sustaining" the patient during the fever; the good which we may look for being in reality the immediate action of the stimulant on the brain when its power begins to fail or to work irregularly in consequence of impoverished blood circulating through it. If we would avoid the one and obtain the other, it seems to me that we must wait for the indication of failing power before having recourse to it; and that when the necessity arises, its quantity must be measured only by its effects. The delirious wanderings will not indeed immediately cease, but they will be at once moderated; while sleep will return more surely and more safely than by the free use of opium, and the weakness and prostration to which the tremor, when present, is due, will also speedily subside.

The two other cases which I have to relate belong to a different class, and may perhaps admit of a somewhat different explanation. The point at which they seem to me to come into relation with that which has just been recorded, is, that the delirium was removed by the free administration of food and stimulants. It is extremely difficult to convey in words an account of those somewhat indefinite circumstances which must often guide the physician in his diagnosis; but the conviction was strong in my own mind that the delirium was mainly due to starvation, and the result seemed to justify that conclusion. Diet rather than medicine guided the treatment in each case.

CASE II.—F. W., æt. 30, admitted into York ward on the 28th of January 1868. He was reported to have had a slight attack of rheumatism about eight years ago. Two weeks since he again began to suffer from pains in his joints, the attack being chiefly confined to one knee. It was stated afterwards that he had been in the habit of drinking freely in former years, but not latterly; and that when under the influence of liquor he became furious, and had been knocked about the head a good deal at different times.

When admitted, there was nothing remarkable in his manner or appearance; some pain and swelling of the knee continued; tongue coated; bowels confined; urine acid. Ordered hydr. subchlor. gr. iv., pulv. op. gr. j. h. n. s. Haust. sennæ primo manè sumend. et repet. si op. sit. Pot. bicarb. ʒj. ex haust. Pot. cit. quartâ quâque horâ sumend.

On the 31st, the symptoms having much improved, the amount of potash added to the saline draught was reduced to one half; and on the 4th February was directed to be administered only three times in twenty-four hours.

On the 6th it was observed that he was somewhat peculiar in his manner. He had taken a great aversion to the patient who occupied the adjoining bed, and had a sullen, angry look. Up to this time he had been kept on low diet. He was ordered immediately to have 4 oz. of brandy, with additional nourishment; the salines were replaced by decoction of bark and iodide of potassium.

Towards evening he became so noisy and violent that it was necessary to remove him downstairs, in order that he might not disturb the ward. More brandy was given, and half a grain of morphia administered, without any effect in quieting him. The dose was repeated the following night, and a second half-grain after four hours, equally unsuccessfully. There was no sleep or even quietude produced by the morphia; he continued talking, shouting, and singing. At the same time, it was observed that there was no tremor about him, no tendency to perspire, and the delirium itself was quite unlike that of delirium tremens. The tongue was white, but without the creamy, tremulous appearance so constantly seen in delirium which is dependent on habits of intoxication. On the 10th he was consequently ordered to leave off all medicine, and only to take 2 grs. of calomel at bedtime, and he was encouraged to take all the nourishment possible, including a liberal allowance of porter. The calomel was repeated the following evening.

For some days there was little evidence of improvement, but he had night after night short snatches of sleep; at times during the day he was tolerably quiet, and then again would break out into fits of noisy delirium, sometimes singing, sometimes shouting at the top of his voice, and sometimes preaching. At such times it was impossible to gain his attention in any way, while at others he showed more or less knowledge of what was said to him.

By the 14th his nights were less sleepless, and his days proportionately quieter; but his fury was replaced by some degree of sulkiness, when he refused to answer questions, though apparently quite able to do so.

On the 16th the brandy was reduced to one-half, and on the 20th was omitted entirely; but was again resumed on the 25th. He ate and drank well during the remainder of his time in the hospital, but without any return of the rheumatic affection; and he left the hospital on the 3d March convalescent, but still not quite in a healthy state of mind. He was occasionally queer in his behaviour, and persisted in some of the delusions which had marked his previous state.

CASE III.—L. B., æt. 56, admitted into Queen's ward on the 28th of December 1867. This woman was reported to have swallowed an ounce of a mixture used for the purpose of cleaning clothes, containing acetate of lead, a few hours before her admission. She had subsequently vomited freely, but she was evidently much alarmed and in a highly

nervous and excitable state. She was a thin, pinched, and rather nervous-looking person; and the mark of a blow was observed on her forehead, of which she could give no account. After her admission the vomiting continued slightly, but was accompanied by a good deal of straining and spasmodic efforts to retch. She was ordered a morphia draught at once, to be repeated at night, and this was followed by a saline purgative with dilute sulphuric acid next morning. Only small quantities of cold beef-tea were given, and the morphia repeated the following night.

On the 30th she seemed to be going on quite well, and no medicine was prescribed; the same diet was maintained to give the stomach rest. Towards evening, however, she became restless and flighty, and subsequently broke out into noisy delirium, so that it became necessary to remove her from the ward. Half a grain of morphia was injected under the skin; and no sleep being obtained, she had given to her a senna draught, with twenty-five minims of laudanum, about 3 A.M., and some brandy.

Next day she was directed to continue the brandy, nourishment was given freely, and half a drachm of laudanum at night.

January 1st.—She had passed another restless night; the delirium continued. She was very talkative and excited, but with no appearance of tremor. She talked very rapidly, was impatient of restraint, and fancied that she was wanted. The laudanum was repeated at night; and as she became more violent, half a grain of morphia was again injected under the skin after an interval of about three hours. After this she had some sleep, and was calmer next day. The bowels were acted on by a senna draught, and she took her food well.

From this time she continued to improve, and was discharged convalescent on the 20th, when she was given over into the charge of the police, as it came out during her stay in the hospital that there was some charge against her, which no doubt was in her mind during the ravings of the delirium.

The two cases just related present a certain analogy, which has induced me to place them on record together. In each there was a predisposition to the attack, and the acute symptoms were developed while they were kept on low diet, and were, I cannot doubt, in great measure caused by want of food. Perhaps if the circumstances had been more fully known, the plan of diet would have been different; but it is always easier to form an opinion after the issue is known than to decide which course ought to be pursued when the facts are only imperfectly before us. Certainly the result has not tended to impress me with the belief that it would have been right in either case to have "supported" the patient largely with brandy from the first; or, even if it be true that such a

plan might have warded off the delirium in these special instances, that the same treatment would be called for in such as evinced no tendency to delirium at all.

In the first of these cases the symptoms were those of a subacute attack of rheumatism, which had already lasted two weeks before his admission; and as the chance of any great severity of the rheumatic affection may be said to have been by that time over, it was probably unnecessary that the patient should have been kept for so many days on so small a quantity of food. He showed no sign of failing power, indeed, till the delirium began; and as a general conclusion from observation of a large number of cases, I must express my belief that, while any degree of inflammatory action is going on, the smallest amount of food which can be taken consistently with the well-being of the patient, is the best. In this there is room for the exercise of a large discretion, as in many instances food is necessary, though the symptoms are acute; and I am free to confess that in this case the continuance of the low diet may have been an error of judgment from which a fuller knowledge of his previous history might have saved me.

In the second case the plan of diet was adopted for the purpose of giving the stomach rest after it had been exposed to the action of oxalic acid, the irritability of the mucous membrane being shown by the retching and straining to vomit after her admission. And if there had been any urgent call to give supplies of nourishment, it would have been more prudent to have used nutrient enemata than to have taxed the stomach with a larger quantity of food. This treatment was only continued during three days before the delirium began; and it would probably be attributing too great importance to it to suggest that it was one of the causes of the delirium, were it not that, from other circumstances connected with the case, there was every reason to believe that she had been starving for some time previously.

It is not my intention to speculate on the manner in which delirium is brought about by want of food. That it is a constant attendant on certain stages of inanition is well known; and while it is not to be supposed that such a stage had been reached in either case, it is consistent with all that we know

of the causation of disease to believe that when a predisposition exists, a slighter degree of the same influence will produce the effect than when it is the only appreciable cause of the affection. That such a predisposition existed in the first case was shown by the history of his violent excitement under the influence of drink. In the second instance it would perhaps be more correct to say that there was a mental or moral cause in operation, as well as the physical, than to call the one predisposing, and the other exciting, with reference to the delirium. In both cases the inference that want of food was one of the circumstances which led to its occurrence seemed to be justified by the symptoms at the time; and besides this, it was the condition which could be most quickly and most easily remedied, if there were any truth in the hypothesis. It was therefore the indication which was at once seized and acted upon. The result seems to have borne out the conclusion arrived at; and while I do not for a moment undervalue the use of opiates in such cases, and while believing that they did some good service, especially in the second case, I still hold that they were only subordinate to the food and stimulants which were given at the same time.

One point calls for remark in comparing these last cases with the first which has been recorded. It is the absence in them of the tremulous movements to which I have alluded as marking so definitely the place in which it ought to be classed. And it may be asked why should the same condition not be seen when the delirium was in all alike free from any complication of inflammation in the brain, and due to causes which were not altogether dissimilar? My answer to this would be, that there was a great difference in the degree of exhaustion of the nervous system; and that while the delirium of acute rheumatism is not a very unusual occurrence, such delirium as was seen in the two more chronic cases could not have occurred without the concurrence of other causes besides that of the exhaustion produced by a short allowance of food. It is also to be borne in mind that whereas the blood is only passively spoiled, so to speak, by withholding proper nutriment, it is in some sense actually poisoned in rheumatic fever; indeed, there seems good ground for believing that there is some direct relation between the

altered condition of the blood and the existence of tremor, and that it is not simply a question of nervous exhaustion, as might be assumed at first sight. This explanation, at all events, agrees very well with the fact of its presence in delirium tremens, typhus, and the so-called typhoid states, and its absence in many other forms of delirium.

In this communication I have endeavoured to avoid doing more than adding a few explanatory notes of the circumstances which guided the treatment, and the reasoning which led to the conclusions drawn from the cases while under observation. In so far as it is possible, histories of medical cases ought to speak for themselves; but there are very many points which it is almost impossible to detail in the report of the case which nevertheless necessarily impress the mind of the observer, and influence his conduct. The addition of such explanations becomes all the more necessary when the notes of the case are not entirely drawn out by the author. In the present instance I have to acknowledge my obligation for the greater part of the two last cases to the notes of the Medical Registrar, Dr. Reginald Thompson, whose accuracy enables me to submit the details with every confidence of their faithfulness and truth.

A. W. BARCLAY, M.D.

III. ABSTRACT OF CLINICAL LECTURES.

LECTURE I. *On the Medio-lateral Operation for Lithotomy.*

SINCE the introduction of anæsthetics in surgical operations the rapidity with which those operations may be performed has lost much of its importance. With regard to lithotomy several modifications of the old lateral operation have been of late suggested. The object of these has been to diminish the risk of those accidents which undoubtedly have occasionally happened during its performance to the most skilful operators. These modifications have sometimes appeared to occupy more time than the ordinary lateral operation, and the brilliancy of the effect of the proceeding has thereby been somewhat diminished. It must, however, be borne in mind, taking a number of cases together, that operation which is the least likely to be attended with any accidental complications will prove to be the one which occupies the least time.

In October 1867 I first performed and described the operation which I am about to mention; and in January following I saw for the first time an account of Sir W. Fergusson's operation by a semicircular external incision.

Sir W. Fergusson's operation in principle resembles the one which I have performed, and I allude to it particularly here because it appears, from the account to which I have referred, that Sir W. Fergusson performed his first operation by semicircular incision on the 16th of February 1867.

The medio-lateral operation is performed in the following way :

The patient is placed in the ordinary position for lithotomy, and a grooved staff having been introduced, the skin of the scrotum is held moderately tight by an assistant. An incision is then made in the median line of the perinæum; this should extend through its posterior half, terminating two or

three lines in front of the anus ; from this point the incision is continued for a quarter of a circle round the front and left side of the rectum. The finger of the left hand may then be put into the wound and the rectum pressed back whilst an additional touch or two with the knife separates it still farther from the parts in front. The forefinger of the left hand is now passed into the rectum, and the knife, with its back towards the bowel, is passed, at the posterior part of the central incision, into the membranous portion of the urethra. With the finger as a guide this is done with great ease and certainty ; a bistoury or knife with a probe at its extremity is then passed into the same opening, and made to slide along the staff into the bladder. The blade of the knife is then directed towards the patient's left side and somewhat backward, and as it is withdrawn the heel of the knife passes in the direction of the original incision through the skin ; the point of the knife remains very nearly in the median line ; a free external incision is thus produced involving no important parts, with a small opening into the bladder. The urethra being opened in the median line is reached with the greatest facility with the finger, and the incision into the bladder is in the same way very easily dilated. The forceps, or any other instruments that may be used, are also introduced more directly into the bladder than in the ordinary lateral operation.

In this operation all the usual accidents and difficulties which are likely to occur in lithotomy are guarded against. With the finger in the rectum as a guide the urethra may be opened without difficulty, and the probe-pointed bistoury being guided by a grooved staff cannot well fail to enter the bladder.

The incision into the prostate gland is made from within outward, and this I consider an advantage. An incision made in the opposite direction partakes more or less of the nature of a stab, and the point of the knife, even when guided by the most skilful hand, will sometimes wander from the groove in the staff. I suppose that there is no operator of experience to whom this has not happened. It is an accident which, when it does occur, may generally be easily remedied ; but still it is one which has led to very unpleasant results, and one which every operator would gladly avoid if possible.

The medio-lateral operation for lithotomy is performed in far less time than it requires to describe it, and I have been surprised, in operating both upon the dead and living subject, with what facility it is accomplished. The instruments which I have used are an ordinary staff grooved in the median line, a common narrow scalpel cutting on one side only, and a curved bistoury with a probe projecting two lines beyond the termination of its cutting edge.

In addition to the case just mentioned two others have recently come under my care, in which I performed the medio-lateral operation. The particulars of these I will briefly mention.

F. W., æt. 7, was admitted on the 15th of July into St. George's Hospital. He was sounded under chloroform on the 18th of the same month. The sound came in contact with a stone before it had entered the bladder, and another stone, or part of the same stone, was felt in the bladder.

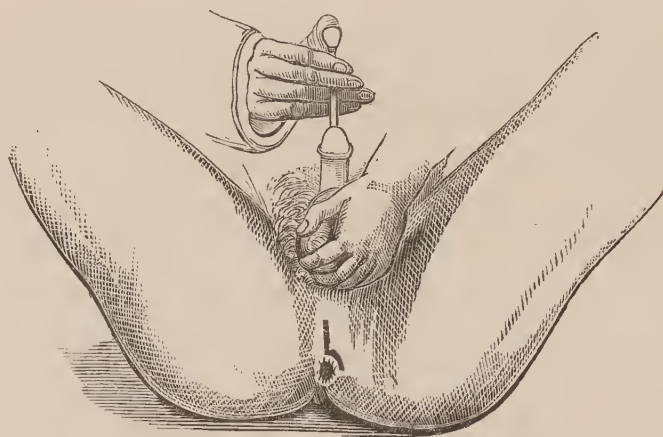
On the 23d of the same month the operation which I have described was performed. A stone was felt in the urethra, but the neck of the bladder was nevertheless incised. The stone in the urethra was at once seized by the forceps and extracted. The finger was then passed into the bladder, and another stone was felt. The forceps were then introduced into the bladder, and the second stone was extracted without any difficulty. The two portions of stone had evidently been connected together at no very distant period. It then must have formed a stone bent nearly at a right-angle, one portion of which was in the prostatic part of the urethra, and the other in the bladder. These had, as far as I could judge, been in some way disconnected before the operation. The portion of the stone which lay in the urethra was much larger than the part which was in the bladder. No unfavourable symptoms followed the operation. The boy was much easier the day after the operation than he had been for a long time previously. On the 29th of August the wound had completely healed.

G. H., æt. 10, was admitted into St. George's Hospital on the 26th of August 1868. He was sounded under chloroform, and a stone detected on the 28th.

The operation above described was performed on the 3d of September. A mulberry calculus was extracted without any difficulty. The wound had healed, so that no water passed, on the 29th of September. In this case the patient had a remarkably large rectum. It remained passively dilated immediately above the sphincter to the size of a common hen's egg. The introduction of the finger into the rectum made me aware of this fact, and I was careful to direct my incision into the neck of the bladder more directly outward than usual. Had the ordinary operation for lithotomy been performed, the rectum would in this case have been in great danger of being wounded.

Sir W. Fergusson observes that in the cases in which he performed lithotomy by the semicircular incision, the wounds healed more slowly than after successful lateral lithotomy (*Lancet*, Jan. 4, 1868). This might naturally be expected from the fact of the rectum being separated from the bulk of the urethra, and allowed to fall backward. This inconvenience is obviated in the operation which I have described, as the relations of the rectum to the parts in front are not disturbed on the right side.

The accompanying diagram illustrates the external incision in the medio-lateral operation.



In children a single incision with the scalpel is generally sufficient, but in adults the circular part of the wound should be deepened either before or after the urethra is opened. Should the stone prove large, there is no difficulty in obtaining more room at the neck of the bladder by making an incision in the prostate gland on the right side as well as upon the left. This is easily accomplished by the probe-pointed bistoury introduced upon the finger and guided by it.

The external incision in the medio-lateral operation combines, as it appears to me, the advantages of all the different incisions which have been recommended. It affords sufficient room for the use of instruments. These may be introduced in the median line, and the rectum is not likely to be displaced or injured. The operation as a whole is, I think, the simplest in conception, the easiest in execution, and the least liable to be attended or followed by any unfavourable complications of all the operations for lithotomy.

LECTURE II. *On Repair of Arteries after Injury.*

When an injury is inflicted upon the internal coats of an artery, or when the internal coats of an artery become spontaneously diseased, a process of repair is instituted: this is effected by means of a deposit from the blood. A number of corpuscles, resembling the white corpuscles of the blood, adhere to the injured lining-membrane; and connected with these, and probably formed by them, is a quantity of fibrin-like substance, which glues together for a time the divided edges of the internal membrane. This material is capable of becoming as much organised as the internal lining of the arteries; and when it does so, the repair is complete. But it may, and often does, happen that that material deposited does not become so organised. A great practical distinction is here drawn between those cases in which the material deposited remains a part of the living tissues, and those in which it does not. When it does become organised, it is used in the process of permanent repair; when it does not, it must sooner or later be removed in the current of the circulation. The material used in the process of repair in arteries is different from that used in the repair of serous membranes. The one is a deposit from the blood, the other is a secretion from a membrane.

Hunter believed, indeed, that the lining-membrane of an artery would secrete lymph like a serous membrane, and he thought that by keeping the two sides of an artery in apposition he could make them unite. He tried the experiment in the first case in which he tied the femoral artery for popliteal aneurism. He used four ligatures, so as to compress the sides of the vessel for a considerable distance. Secondary hæmorrhage occurred. The patient ultimately recovered; but it is evident, from the details of the case as given by Sir E. Home, that union did not take place between the sides of the vessel as was expected. For a very evident reason this kind of union does not take place between the opposed sides of arteries. If it did, these tubes would be constantly liable to be obstructed.

It has nevertheless been maintained, both by physiologists and surgeons, that this kind of adhesive inflammation

does take place in the interior of arteries. Gendrin even cites an experiment to prove it. He threw an irritating injection into an artery between two ligatures, and describes as the result which followed the inflammation, a plastic layer which lined the internal membrane, and ultimately filled up the cavity of the vessel.

Mr. Turner, Mr. Hodgson, and Mr. Travers have all followed the idea of Hunter—supposed to have been proved by Gendrin—of the effusion of coagulating lymph from the lining-membrane of the blood-vessels, and have considered the matter found in their canals as a secretion by the capillary vessels under inflammation.

Now careful observation and experiment alike refute the idea that the material found in blood-vessels, when they are inflamed in consequence of disease or injury, is produced as a secretion would be from an inflamed serous membrane. This is a point of very considerable interest at the present time, inasmuch as the different modes by which hæmorrhage from arteries may be arrested has lately occupied a large share of public attention.

Some years ago I repeated Gendrin's experiment, and found that if the blood were carefully excluded from a blood-vessel, irritating substances might remain in contact with its lining-membrane for a very considerable time without any effusion of lymph taking place. If the blood, however, was allowed to enter the vessel, then a deposit of white fibrin-like material took place. Again, I have allowed an acupuncture needle to remain in contact with the main artery in a donkey's leg for three whole days. At the expiration of that time there was no appearance whatever of lymph on the lining-membrane of the vessels. A case was lately in St. George's Hospital in which an acupuncture needle was allowed to remain in contact with the femoral artery for three days, and in which no effusion of lymph took place on the lining-membrane of the vessel. Cases and experiments illustrating the same point might now be adduced in great number.

There are some tissues in the body which are non-vascular. They are nourished by imbibition from surrounding parts, rather than from any blood-vessels of their own. The car-

tilages of the joints belong to this class. When a joint is diseased, the synovial membrane may become red, and may secrete different fluids into its cavity; but the cartilage, as long as its structure is unimpaired, remains of its natural white colour. By degrees the synovial membrane may encroach upon the cartilage, or this may become altered in structure; and then, but not till then, will the ordinary products of inflammation be secreted from its surface.

The lining-membrane of the blood-vessels in like manner is a non-vascular tissue. It lives by imbibition; and as long as it retains its natural structure, it does not secrete the ordinary products of inflammation. When the lining-membrane is altered in structure, or when it is so far destroyed as to allow the vascular coats of the vessel to come into play, then the ordinary results of inflammation may be produced in its interior.

Some of you may have seen in the Oxford ward a case in which a pulsating tumour in the ham followed a stab with a knife; an acupressure needle was here introduced, so as to compress the vessel leading to the pulsating tumour. From what I have now said, you will perceive that this was not done with any view of producing adhesion of the sides of the compressed vessel. The object in view was to leave that part of the artery which was originally wounded by the knife at rest till the natural process of repair should take place. This is usually prevented in any case of aneurism by the constant impulse of the blood. The material deposited, and which if allowed to remain would become organised, is displaced by pressure from within. Another layer is deposited in its place, and this again in its turn yields to the same force. Thus are formed the successive layers of fibrin found in an aneurismal sac. Each one of these is displaced as soon as formed, and no one is allowed to remain sufficiently long to accomplish the intention with which it was first deposited.

Now in the case to which I have alluded the acupressure needle prevented any impulse from being communicated to the newly-deposited fibrin. This had time to become organised, and union by first intention was effected. The term "first intention," as here used and as used by Hunter, does not refer to time, but to the material used in the process of repair.

If the material used be a deposit from the blood or be a portion of blood itself, then the union is said to be by the first intention, however long that process may be in its accomplishment. If a secretion be the material used in the repair of parts, then the repair takes place by second intention, or by some other process.

The observations now made apply directly to the use of acupressure after amputation. This practice, a very valuable one in itself, has, by the writers who have advocated its use, been spoken of as producing union of the opposed sides of arteries. Mere apposition, Sir James Simpson says, is sufficient to close the largest arteries. Others who have followed Sir James Simpson have stated very boldly that the coats of an artery, if kept together for a few days, will unite.

Now from what has already been stated it will appear that union does not take place when an artery is compressed, unless the pressure be continued sufficiently long to destroy the structure of the lining-membrane. The real repair, if the acupressure needle be removed before this is done, takes place at the cut extremity of the artery, and not at the point at which acupressure was applied. If the adhesion at the divided end be not sufficient, there is a risk, as has been recently illustrated, that the impulse of the blood will remove the coagula, and that secondary hæmorrhage may take place.

Intimately connected with the present subject is the mode of arresting hæmorrhage by torsion. Much light has lately been thrown on this practice by Dr. Humphry and Mr. Bryant. When an artery is twisted, the same effect is produced upon its internal coats as if it were forcibly extended. Being more brittle than the outer coat, they are torn across, and have a tendency afterwards to curl up. If an artery, according to Mr. Bryant's plan, is twisted until something is felt to give, and then left, the internal coats will have become lacerated, and their edges will project into the interior of the vessel. The end of the artery which, if the torsion had been continued, would have been twisted off, is left as a kind of rude cork at the end of the tube. The blood then coagulates in contact with the lacerated internal coats. When these are deficient, the opposed sides of the external coat are brought in contact by the torsion; and if left at rest, the process of

repair begins. We have lately had an instance in this hospital of a patient under my care in whom the process of torsion was applied to the femoral artery. The case generally was by no means a favourable one. The artery was, however, completely commanded by the torsion, and the wound healed almost entirely by first intention. As far as my own experience goes, I am inclined to think that torsion is more applicable to the larger arteries than to the smaller ones, inasmuch as they can be more easily isolated from the surrounding structures, and their internal coats are consequently more easily lacerated.

LECTURE III. *On Mortification and other secondary Affections in consequence of Disease of the Arteries.*

IN the last lecture we considered the process of repair that is instituted when an artery is injured, and found that this process is conducted by means of a material deposited from the blood, closely allied in its nature to ordinary fibrin. In this adventitious substance may be seen under the microscope, as has been so well illustrated by Dr. Beale, a number of granular cells undergoing subdivision and multiplication. These cells in their characters resemble the white corpuscles of the blood, and cannot, in fact, be distinguished from them. We considered the fact that the material thus deposited in the healthy process of repair became organised, but that in certain states of disease it might not become organised, and that then (except in cases of aneurisms) it was removed in the current of the blood. The principal object of the present lecture is to trace some of the effects which may be thus produced.

The two processes, which can be traced in the repair of blood-vessels, bear an analogy to similar actions which are more easily observed on the surface of the body. The material effused between the cut edges of a wound in the skin may be completely organised, so as to remain a part of the living tissue; or, on the other hand, it may be thrown off as unorganisable matter. In the latter case the quantity of new material generated is very much greater than in the former.

The matter thus formed by the multiplication of cells on the surface of the body, and not organised, is thrown off in the process of suppuration; but the products of any analogous actions in diseases of the vessels are liable to be poured into their cavities. If the process of repair in an artery is accomplished by the first intention, only so much new material is deposited as may be requisite; but if the repair by the first intention be not accomplished, then other actions take place which may lead to the obstruction, more or less complete, of the vessel.

The morbid products may then mix with the blood, which has a tendency to carry them in the course of the circulation. The quantity of material thus formed, either by the subdivision and multiplication of adherent cells, or by the direct deposit of fibrin from the blood, is often very great; so that the cavities of the largest as well as of the smallest vessels may become closed by this means for many inches. The number of cases in which veins are obstructed in this way is sufficiently numerous and of constant occurrence; but the instances in which arteries are similarly affected are comparatively rare. When any matter is thus deposited in a diseased vein, and does not remain adherent, either directly or indirectly, to the sides of the vessel, we naturally look for the results of its being carried in the course of the circulation to some secondary effects in internal organs: when an artery is similarly affected, we as naturally should look for analogous results in the parts to which the ultimate subdivisions of the artery are distributed. It does not, however, often happen that the cavity of an artery becomes obstructed by the fibrin-like material above mentioned, independent of other disease. In wounds of arteries which do not unite by first intention, if a large quantity of this material is deposited, it is not generally in the interior of the vessel. In the usual course—at least in the human subject—an aneurism forms, and the fibrin then is deposited outside the vascular system. But there is a class of cases which does not hitherto appear to have attracted much attention, in which the products of other diseased actions may find their way into the interior of arteries; and it is to these that I would now particularly refer. The changes in the arterial coats themselves have indeed been

well observed; but the secondary effects produced by the entrance of the products of these diseased actions into the circulation have not been satisfactorily traced.

Dupuytren believed that spontaneous, senile, or dry gangrene was due to inflammation of the principal arteries of the affected part; and that the blood coagulated in the cavities of these vessels, either in consequence of its being in contact with the inflamed lining-membrane, or from its admixture with coagulable lymph, or as a result of ulceration of the internal coats (*Leçons Orales*, t. iv. pp. 249-50).

Sir Benjamin Brodie has recorded a case of mortification from what he believed to be inflammation of the principal vessels of a limb: "From the bifurcation of the iliac trunk down to the middle of the thigh the artery was obliterated, being completely filled with coagulable lymph, evidently effused from inflammation" (*Works*, vol. iii. p. 372).

If the account above given of the mode in which arteries and veins ordinarily become obstructed be correct, the process is one in no way necessarily connected with inflammation; and if the coats of the vessels are at all inflamed, it is as a secondary consequence of actions which occur previously within their cavities. The matter which obstructs the vessels is in no sense a secretion, but is formed by a deposit directly from the circulating fluid, or by the subdivision and multiplication of cells resembling the white corpuscles of the blood, and of matter formed by these cells. In chronic states of disease the changes observed in the coats of arteries consist chiefly of steatomatous or atheromatous deposits. These deposits are liable to become softened, and when the lining-membrane of the vessels gives way, this softened material is poured into the current of the circulation. The blood in a diseased artery then becomes mixed with a material (in process of degeneration) really derived from the arterial tissues.

Lebert describes the pultaceous softening of atheromatous disease of arteries, on microscopic examination, as of a yellowish-white colour, containing molecular granules, vesicles, granules of fat, crystals of cholesterine, calcareous granules, and débris of the elements of the middle coat (*Anatomie Pathologique*, p. 513).

Now Gaspard has experimentally proved that fatty mat-

ters will not readily pass in the current of the circulation. Some fluids, indeed, as demonstrated by Majendie (*Précis Élémentaire de Physiologie*, tom. ii. p. 389), pass readily from the arteries into the veins; but others are obstructed in their passage. Clear solutions of tartar emetic, of opium, or of nux vomica, as shown by Gaspard, pass readily in that way, and little or no irritation is produced in the vessels through which they are conveyed. But other substances, such as the infusion of tobacco, the solution of acetate of lead, or putrid fluids, when injected into the artery of a limb do not readily pass through the capillaries; and then the local irritation is great. That which may be thus illustrated by physiological experiments, may also be observed in practice, although the opportunities of so doing may be of rare occurrence. In the first of the following cases the diseased products from the internal coats lodged in the large arteries in which it was formed, in arteries of intermediate size, and in the capillaries. In the second case it lodged in the capillaries only.

CASE I.—M. D., æt. 50, was admitted on the 24th July 1867 into St. George's Hospital, under the care of Dr. Ogle. There was then a tumour on the right side of the navel, which had existed, as far as she knew, two months. On the 6th of August the toes of the right foot became affected with gangrene. There was a good deal of pain in the ankle and toes. There was then no œdema.

In the beginning of October a fresh swelling appeared in the left inguinal region, and in a few days the left leg became œdematous. I was now requested to see her in consultation with Dr. Ogle, and concluded that, as the gangrene had occurred on the opposite side to the swelling, it depended on some disease of the arteries, and not upon obstruction to the veins.

The patient died on the 29th of October. Upon a post-mortem examination, the liver and kidneys were found fatty. In the right iliac region was a large hard firm mass about the size of a foetal head, which lay somewhat obliquely across the abdomen, resting on the right iliac artery just after its bifurcation. It was found to be a cancerous mass, hollow, and full of fæces. In the left iliac fossa was a similar malignant deposit, the size of an egg, and closely adherent to the bone. The inguinal glands on this side were likewise enlarged, and one gland, the size of a walnut, pressed upon the femoral vessels as they passed under Poupart's ligament. The deposit in these glands was of the same nature as in the tumour on the right side of the abdomen. The aorta was in several places much diseased; large deposits of atheroma, as big as a sixpenny-piece, were found all over its surface. On the lining-membrane were some oval flattened masses the size of large peas. Some

portions of these were of a dark-red, others of a bright-red colour; and one lay completely detached. There was no trace of inflammation of the lining-membrane of the vessel. The right popliteal artery contained a long decolorised mass of fibrin, in which two of these red masses were embedded. This fibrin adhered firmly to the vessel at one part by a broad membranous band. The canal of the artery was, however, pervious. All the veins in the left lower extremity were full of decolorised clots, which were adherent. The posterior tibial veins on the right side were also plugged. The nature of the oval masses found in the interior of the vessel formed the chief point of interest in the case. They all presented a shining lubricated exterior, and adhered, with one exception, tolerably firmly to the coats of the vessel. A delicate membrane, apparently continuous with the lining membrane of the artery, could be traced to a greater or less extent over their surfaces. Upon a microscopic examination, these masses were found to consist of blood and altered fibrin, and of fatty matter.

CASE II.—C. D., æt. 55, was admitted into St. George's Hospital under my care on the 5th December 1866. He had at that time a sloughing ulcer, about three inches in extent, nearly surrounding the lower part of the right leg. He attributed the ulcer to a bruise which he had had a month previously. The patient was depressed, with a full, weak pulse, which sometimes intermitted. The cause of his depression was carefully looked for, but no evident sign of disease of any of the internal viscera was detected. With slight variation, the ulceration continued, and exposed a portion of the tibia; and the patient died on the 2d of January 1867.

Upon a post-mortem examination, the body was very fat. The lungs were much congested. The heart was very large, weighing twenty-four ounces. The valves were very atheromatous, and quite rigid. The aorta was covered with patches of atheroma the size of a threepenny-piece; some of these patches were softened and broken down in their centres. Where this had taken place, ulcers with ragged edges were left surrounded by congestion. The liver was congested and fatty; the spleen diffuent, and its structure broken down. The kidneys were large and coarse, and their structure rotten. The arteries of the right limb were examined, and found to be rigid, and considerably changed by atheroma. Small shreds of fibrin, more or less firmly attached, were found on the surface of the ulcers in the aorta.

It has been generally, and perhaps too hastily, assumed that mortification in cases where the arteries are diseased depends upon a want of a sufficient supply of blood to the part. In Case I., above recorded, we find the circulation partially arrested by adherent coagula in the aorta, the popliteal artery all but impervious from the same cause; and the circulation completely arrested in the distal portion of the limb. But do the facts justify the inference that mortification

took place from want of blood? In cases where the supply of blood is suddenly arrested the part becomes pale and cold. The very reverse of this is generally observed in cases of mortification in connection with disease of the arteries. Thus in a case related by Mr. Turner in the *Transactions of the Medico-Chirurgical Society of Edinburgh*, vol. iii. p. 138, in which the circulation in the forearm was arrested in consequence of an accident, "the forearm was pale, and the veins much smaller and more collapsed than those in the other arm; and when they were compressed they filled slowly."

Mr. Chevalier has recorded a very interesting case of the same kind in volume xiii. of the *Medico-Chirurgical Transactions*. A gentleman received a very severe blow from the shaft of a van in the left groin. This was followed by great pain in the leg and foot. The day following he had lost all sensation in the lower half of his leg. There was no pulsation in the arteries of the injured limb, the skin of which was "pale and cadaverous." After some time the ankle and foot assumed a deep transparent colour not unlike that of new mahogany. This did not disappear upon pressure. The toes were dried and shrunk; they were paler than the ankle, and their substance was transparent; they resembled parts dried and immersed in turpentine. The cuticle did not separate. The temperature of the right toes in this case was 90° , that of the left toes varied from 66° to 71° . On a post-mortem examination the arteries were all found to be impervious in the neighbourhood of the original injury.

Mr. J. A. Gamgee has also related the case of a woman eighty-five years of age, who suffered from gangrene of the foot. The foot in this case had never been black, but was of a dirty-white colour. The popliteal artery of the corresponding side was found obliterated by a firm, adherent, whitish clot. The anterior and posterior tibial arteries were also closed by white adherent clots.

In contrast with these cases, the appearances presented by the great majority of cases in which mortification has taken place in connection with disease of the arteries show that the affected parts have contained much more blood than natural. The blood has stagnated in the capillary vessels, and has been altered in colour and consistence. It has been

defective in quality, and not in quantity.* As cases present themselves in practice various adverse influences may doubtless be brought to bear upon a part at the same time. Thus the circulation through the arteries may be impeded by the formation of coagula in their channels: the return of blood through the veins may be retarded by local pressure, and the quality of the blood may be altered at the same time. All these influences may have their part in the production of mortification in any given case, and may have been in operation in Case I. above related. But the alteration in the constitution of the blood and the consequences of that alteration, is that which appears to me by far the most frequent and the most effective cause of mortification. In Case I. we have portions of blood coagulated in contact with the diseased lining membrane of the aorta. These coagula were covered with a shining membrane, and adhered to the aorta. Considering the force of the circulation through the vessel, we can come to no other conclusion than that they were formed *in situ*; and being formed upon the diseased lining-membrane, or where that membrane was deficient, it is probable, in the highest degree, that they contained some of the products of the diseased actions which had taken place. Those diseased products may indeed have been the efficient cause of the coagulation of these portions of blood. At all events, the existence of these coagula, as they were found, proves that coagulation of blood may take place in living vessels; and that the coagula thus formed may have a firm adhesion to the sides of the vessel or may be independent of them. The tendency to coagulate must have been very powerful where the effect could be produced under so many disadvantages as in the aorta. It is not, therefore, surprising that the same tendency would produce a greater result in more favourable situations. Accordingly we find in the case referred to, where the arterial tubes were

* That the quality of the blood alone, independent of any disease of the arteries, may produce mortification, is illustrated by the following case:

A patient was admitted, under my care, into St. George's Hospital, with a child that she was suckling. The patient had an attack of erysipelas. The child then for the first time became poorly, and the skin of the whole of the toes, and of a large part of the foot, mortified. The toes separated naturally, and the wound healed. The child afterwards continued in perfect health.

smaller, where the impulse of the blood was less, and where the artery subdivided into several branches, that much larger coagula were formed. When these several conditions are present in a still greater degree we find many vessels obstructed instead of one, and the circulation of the part completely arrested.

Independently, however, of the obstruction of the circulation by coagulation of the blood, there are other circumstances with regard to the blood itself which tend to prevent its passage through the smaller capillaries. Thus fatty matters, as has been shown, pass through the capillaries with difficulty, causing pain and swelling. The products of the degeneration of the coats of arteries are chiefly fatty, and when these mix with the blood, we have the conditions presented which so very frequently accompany, if they do not produce, senile gangrene.

When cell-growth takes place in portions of fibrin deposited on the lining-membrane of an artery, that growth may continue for a certain time quite independent of any action in the membrane with which it is in contact; and when the material in which such cell-growth has commenced is detached from its original position, that growth may still continue in the distant parts to which the material containing these cells is transferred.

In Case I. the coagula in the aorta were covered with a thin lubricated shining membrane. The mode of formation of membranes on the surface of coagula of blood in serous membranes was first pointed out by Mr. Hewett in a paper in the *Medico-Chirurgical Transactions* (second series, vol. x. pp. 45-82). The way in which membranes are formed on the surface of coagula in blood-vessels appears strictly analogous to the process which Mr. Hewett has described. A process of organisation in both cases goes on quite independently of any actions in the neighbouring parts, or of any blood-vessels which they may contain. This tendency of the fibrin, when deposited from the blood, to organise itself by multiplication and subdivision of its cells, may continue after it has become detached from its original site; and we may thus have the elements of abnormal growth and development conveyed to a distance. Pain, swelling, softening of parts, and

mortification may thus be produced by diseases originating in the vessels which supply a limb, and at a distance from the part where the effects of those diseases first manifested themselves. It is very difficult to prove in any individual case that such a translation of disease has occurred, because it is manifestly impossible to examine the parts both before and after its occurrence; but where such evident results present themselves as in the cases recorded, it must necessarily happen that less severe affections should occasionally occur.

The mildest form of disease which I have witnessed, and which I have considered of this nature, is an affection resembling a very painful soft corn. The cuticle over the part becomes ragged, and when removed the cutis shows several small black spots. The disease occurs in a part not subject to pressure, and continues several days without alleviation of the pain or tenderness. I have noted it particularly on two occasions, and both times it presented itself in young people on the bulbous extremity of the little toe.

The following case affords an instance of very extensive softening of the pancreas and of other organs in connection with disease of the aorta.

J. P., æt. 53, after a long previous indisposition, was suddenly attacked with violent pain in the back and loins. He apparently fainted from the effects of the pain, and did not recover.

Upon a post-mortem examination, the body was found loaded with fat. The omentum alone weighed more than a pound. The anterior and posterior edges of the right lobe of the liver both presented a discoloured patch. These patches were black in the centre, and gradually assumed a lighter shade towards the circumference, where the tissue of the liver appeared as if it had been dusted with gunpowder. The pancreas was almost entirely disorganised; a small portion, about the size of a Windsor bean, only remained connected with the duct on the right side. This retained its natural structure.

The remainder, of a saffron colour, presented a gelatinous mass, in which the duct terminated at about what would have been the junction of the middle third of the gland, with its head. The inner coat of the gall-bladder was firm and rigid; the outer coat was very flaccid, and the two were separated by a gelatinous fluid. The capsules of the spleen and left kidney were filled with matter of the colour and consistence of black-currant jelly. The left kidney presented two cysts, containing together from ten to twelve ounces of fluid. The diaphragm, where it lay in contact with the spleen, was softened so as to be lacerated with very slight force.

The walls of the left ventricle of the heart were twice their natural

thickness, and softened so as to be easily broken down by the finger. There was a small rim of bone between the right auricle and ventricle. The aorta-valves were not ossified, but on passing the finger into the aorta from the heart, a plate of bone, loosely attached, was separated. This led to a further examination of the aorta, which presented from the termination of the arch to the bifurcation a complete column of bone. Between these points spicula of bone radiated from the circumference towards the centre of the vessel. The pancreas and the gall-bladder in this case were affected in a very different way to the liver, spleen, and kidney. They presented no black deposit, and appeared simply softened.

It must be noted in this case, that the diseased appearances followed exclusively the distribution of the branches of the coeliac axis and of the renal arteries. The theory of a *materies morbi* being conveyed through the blood can alone account for the simultaneous appearance of disease in such different parts. The case occurred many years ago, and the examination was conducted in a private house. No specimen could be preserved, or further details of the case would be given.

It is unnecessary to dwell upon the analogy between the process of softening in connection with diseases of the arteries of other organs, and the affections of the brain from the same cause, so ably pointed out by Dr. Kirkes. In both cases, however, I consider the changes observed to depend rather upon an alteration in the quality than the quantity of blood supplied to the parts. In an organ in which the anastomoses of vessels are so free as in the brain, it could hardly happen, while the quality of the blood remained unchanged, that the arrest of the circulation through one large vessel could affect exclusively any one part of its structure.

Another form of disease, following the distribution of particular arteries, has attracted my attention. It is a strictly local affection, confined generally to one limb, and attended with very little, if any, constitutional disturbance. It commences with small circumscribed swellings in the cellular membrane. The skin over these remains for a time of its natural colour. It becomes red, and subsequently livid. It then ulcerates, and some thick fluid that has formed underneath is discharged; the skin is now left undermined, with irregular livid edges. The patient may go about his occupa-

tion as usual, and appears to suffer very little in his general health; and were it not for the pain which he sometimes experiences, would be little inconvenienced by his malady. These abscesses are of very slow development; and as some heal, others will make their appearance; and thus the disease may continue for years.

These abscesses will form in considerable numbers; each being separate and distinct from the others. When healed they may present the outline of a bunch of raisins flattened, the circumference of each separate patch encroaching more or less on its neighbours. They are generally accompanied with some swelling of the limb; and in one case observed this swelling attained a very considerable size. From the local nature of these tumours, from their chronic character, from the number of places simultaneously affected, and from their tendency to suppurate, I have ventured to call them “CHRONIC LOCAL MULTIPLE ABSCESES.”

CASE III.—E. S., a young man, came under my care on the 2d of January 1866. On the outside of the leg corresponding to the distribution of the branches of the fibular artery were several irregular sores, covered by a gray phagedænic surface, and discharging a thin serous fluid. Portions of the neighbouring parts were enlarged with solid œdema. The edges of the ulcers were undermined and livid. In some parts obscure fluctuations could be felt under portions of skin very little altered in appearance. In other parts, where no fluctuation could be detected, the parts felt “boggy.” The affection had at that time lasted nine months, and he had tried a great variety of remedies.

This patient remained under my care during the years 1866 and 1867; a variety of treatment was adopted during that period. The only remedy which appeared to produce any decided benefit was the local calomel-bath. This he commenced when I first saw him, and resumed on several subsequent occasions.

It was not, however, until the end of 1867 that the leg appeared permanently cured. On the 28th of February my patient wrote to me stating that his leg “appeared to have recovered its natural power, and felt in walking almost as strong as ever.”

In this case there was a history of specific constitutional disease. In the following two cases there was, however, no such history.

CASE IV.—Ellen S., æt. 32, was admitted under my care into St. George's Hospital on the 3d March 1868. She was married, and had four healthy children, the youngest 5 months old. On the outside of the left leg were a number of small round ulcers, presenting phagedænic

surfaces, with livid undermined edges. The affection commenced two years previously, with a small swelling on the lower and outer part of the popliteal space. This increased gradually and slowly, and attained its full size a year ago, after which it subsided. The present ulcers had been in existence twelve months, and had become at times sufficiently painful to prevent her walking; there was no swelling of the foot.

This patient's history was carefully examined into, and no cause for the ulcerations could be found beyond the swelling in the popliteal space above mentioned.

The ulcers rapidly improved under local calomel fumigation repeated twice daily; and the patient left the hospital on the 1st of April.

CASE V.—Mrs. L., æt. 44, came under my care on the 12th January 1868. She had had one miscarriage soon after her marriage nineteen years ago; and had not been regular for two years. When first seen, the leg and foot were swollen to about double their natural circumference. The swelling was caused by solid œdema. Ten or twelve ulcers in different stages of development existed down the outside of the left leg. Three ulcers in this case existed also upon the inside of the leg. The knee was contracted. Extensive induration occupied the popliteal space. She had been unable to walk for several weeks, and was apprehensive that she would not regain the use of her leg. The affection had commenced nine months previously; a small red lump then appeared over the head of the fibula. This was soon followed by swelling in the popliteal space and over the ankle. Small circumscribed oval tumours then formed in different parts. These in process of time became softened, and discharged a thick pus of the consistence and appearance of softened cream-cheese.

The treatment consisted of local calomel fumigation morning and evening, the application during the day of a lotion of sulphate of copper, and a carefully-applied bandage. Iodide of iron was given internally. Fresh abscesses, containing the same cheesy fluid, were opened on the 18th and 28th of February. The ulcers now all began to heal.

At the latter end of March the leg was reduced to about its natural size. The ulcers had all nearly healed, and the patient was able to walk.

September 3, 1868.—This patient called to show herself. The leg was now nearly straight. She could walk for half an hour. The ulcers all remained apparently permanently healed, with the exception of one spot the size of a pin, which still secreted some pus.

It may be noted that in this case the ulcers existed on the inside as well as on the outside of the limb, and that the swelling affected the foot as well as the leg. It is possible, therefore, that the tibial and fibular arteries both had to do with the production of the disease in this case; and that the fibular artery alone was implicated in Cases III. and IV., where the swelling was confined to the leg. Although the

manifestation of the diseases which I am attempting to describe may, from their following the tracts of particular vessels, be supposed to depend on some disease either originating in those vessels, or communicated to them from neighbouring parts, yet it by no means follows that such diseases have not a constitutional origin. In the following instance the disease appears to have been communicated. The history is, however, by no means so satisfactory as might be desired; nor had I the opportunity of carrying out any systematic plan of treatment.

CASE VI.—During the latter part of the year 1866 and in 1867, I saw, in consultation with Dr. Quain, a lady who for several months had had a number of small circular ulcers on her leg. These, as in the former cases, commenced with indurations in the cellular membrane. The skin covering them after a time became implicated. It would gradually become thin and give way; but previously to this, and even before the skin became discoloured, fluctuation could sometimes be detected in the subjacent parts.

The disease in this case was most obstinate, and a number of medical men were consulted, without, as far as I know, any decided benefit. The point of interest in the case is that the husband had what appeared from description to have been a similar affection some time before. The disease in him was also most obstinate, and the ulceration very extensive. He described a place in his leg that he could “put his hand into;” but this appears to have given him little inconvenience, and not to have interfered with his general health, as he hunted with it for a whole season. After his leg got well, which it seems to have done without any particular treatment, the scalp became affected. This affection, which I had an opportunity of seeing, was also most obstinate. Several small circumscribed abscesses, surrounded by induration, were opened at the same time, discharging a large quantity of pus. These abscesses in places extended under portions of skin very little altered in appearance. This condition continued during many consecutive months. The patient’s general health during the time was unaffected.

The conclusions which I would draw from the foregoing observations may be thus summed up. The morbid products of diseases of the arteries (whether originating in them or

communicated to them from other parts) may mingle with the blood. These morbid matters consist chiefly of the results of fatty degeneration, and of fibrin-like matter formed in the vessels. Such products, mixed perhaps with the débris of the arterial tissues, may either mechanically, or by inducing coagulation of, or deposit of fibrin from, the blood, impede the circulation. The tendency to this deposition of fibrin, and the process of cell-development which may commence in such deposits in one of the larger arteries, may be continued to a much greater extent in the capillaries. The actions in these are essentially of the same nature as in the larger vessels, although the material in which they occur may have been transferred from its original site. The principal secondary effects which I am inclined to attribute to the causes now mentioned are (1) gangrene, (2) softening, (3) solid oedema, and (4) chronic local multiple abscesses.

LECTURE IV. *On different local Syphilitic Actions.*

THE idea of the plurality of syphilitic poisons had its origin in Dublin. In the Lock Hospital of that city the observations were made which first led surgeons to distinguish venereal diseases from each other according to the nature of the local affections which they produced. Mr. Carmichael's theory, it is true, has not stood the test of subsequent observation; but it is not too much to say that it laid the foundation of those distinctions with regard to the different kinds of local syphilitic diseases which have now been generally admitted by the profession.

Some recognised system on which a student of surgery may rely is still, however, wanting; and this want is felt both by the profession and by the public to a degree which is greatly to be deplored.

I have lately had under my care a surgeon-major in the army who attributes his shattered health and impaired fortune entirely to want of proper treatment while suffering from syphilis; and if I mention this case, it is only as one out of a very great number where the same imputation has been made. Now I do not for a moment admit that the evil

effects attributed by patients to their treatment are not dependent upon other causes, nor would I say in any individual case that the same train of symptoms, or one equally severe, might not have followed under another mode of treatment. But this I will say, that, taking an equal number of cases, the symptoms altogether will be very much less severe when one plan of treatment is adopted and properly carried out, than they would be when a different treatment is followed, or when the disease is left to take its natural course. And there is one other point upon which I am sure all medical men will agree, viz. that it would be very desirable to have some recognised plan of treatment, if it were only to prevent the impression being left on the patient's mind in after years, that he might have been more judiciously treated, and to prevent any imputation being cast upon the medical attendant.

With objects so important to the profession and to the public, committees have of late years been appointed. The principal of these in England have been the committee appointed by the Admiralty in 1864 to inquire into the best mode of treating syphilis, and a committee of the surgeons of the Lock Hospital, who undertook to carry out the experiments instituted in the year 1865 by Professor Borck. The first of these committees were requested to give their attention particularly to the following points :

1. Whether mercury is an agent to be indiscriminately resorted to in the treatment of syphilis.

2. The proportion and nature of the cases in which its administration is useful or necessary.

3. The proportion and nature of cases, if any, of primary and secondary disease in which it may be entirely dispensed with ; characterising the forms of disease, if any, in the treatment of which mercurial agency is not required.

The committee in their report state, that "whether a given local affection will result in syphilis cannot be known with certainty until the constitution is actually involved." The committee divide venereal ulcers into two kinds—the "simple local sore" and the "syphilitic sore." The local sore prevails over all others in the ratio of about four to one. *With the exception of this purely local sore*, all venereal

sores are liable to contaminate the constitution. The syphilitic sore presents itself in three forms—one characterised by induration throughout; one soft in its early stage, and becoming subsequently indurated; and one soft throughout its whole course.

The evidence the committee believe is conclusive as to the impossibility of pronouncing with certainty upon the character of a sore upon its first appearance. Even though it remain soft throughout its course, it is not certain, although highly probable, that it will prove to be non-infecting. Thus a non-indurated sore is a purely local sore if it turns out not to infect the constitution: it is a syphilitic sore if it does. The original distinction between the two classes of sores is here entirely given up; and no answer is given to the question of the Admiralty as to what forms of disease may not require the administration of mercury!

The distinction between the two classes of cases is left to rest entirely upon the results produced. A sore is called local because it ultimately turns out not to be infectious, and it is said not to infect the constitution because it is local. Another sore, presenting exactly the same characters throughout, is said to be syphilitic because it infects the constitution, and to infect the constitution because it is syphilitic.

By the side of such conclusions we may fairly place a criticism of Sir Benjamin Brodie's with regard to a dogma formerly held by Abernethy.

“Mr. Abernethy,” he says, “in his work on what he calls Pseudo-syphilis, lays it down as a rule that syphilis is uniformly progressive if mercury be not administered: and accordingly, if a man came before him in whom the symptoms yielded to other treatment, he pronounced that the disease was not syphilis. It is true that he gave no reason for this extraordinary assumption; it was a complete *petitio principii*; and this illogical conclusion has much diminished the value of this part of his works.”

If, with regard to the subject before us, we were, without some more satisfactory explanation, to admit with the committee that the simple local sore “never extends” its influence beyond the inguinal glands, and that the soft sore is nevertheless one of the three forms in which true constitu-

tional syphilis first shows itself, we should have made no real advance in this branch of the subject since Mr. Carmichael undertook to investigate it, upwards of fifty years ago. A careful study of the actual operations of nature will not leave us in this perplexity. Nature is always true to herself, and if we do not rightly interpret her, we are not justified in saying that she does not act by fixed and definite laws.

There is one kind of syphilitic sore which begins by a pustule. This is developed within a very few days of the application of the poison. Thousands upon thousands of such sores have been artificially produced, and yet no record has as yet been given, as far as I know, where the secretion from such a pustule produced, when inoculated, any constitutional symptoms.

I will mention a typical case which some of you must have seen. A. L. was admitted into St. George's Hospital in June 1865. This patient underwent a series of inoculations from her original affection. She was inoculated until the matter from that series produced no further effect. The inoculations were all allowed to take their natural course, and all healed about the same time. A series of nine successful specific inoculations were made in this case. The patient had never had any former disease, and was subjected to no constitutional treatment. She was seen nearly two years afterwards, and had up to that time suffered from no constitutional affection. The natural action in such a case is distinct, uncomplicated, and should not be confounded in our descriptions with any other.

In contrast with this case I may mention that of J. N., whom many of you must likewise have seen. This patient was admitted into St. George's Hospital on the 11th July 1865. He had a large circular indurated sore on the internal prepuce. The discharge from this at first was not purulent, but it was made to suppurate artificially. The sore had not begun to heal. The secretion from it was inoculated again and again until no more secretion could be obtained, and yet without any result. No local inoculation could be performed in this case, for the reason, I doubt not, that the patient's whole system was already infected.

In the early stage of this patient's case the glands in the

groin had become inoculated. The result of that inoculation was not the production of pus, but of the same kind of circumscribed induration, or adhesive inflammation, which occurred at the original seat of the disease.

We have, then, here the outlines of two separate actions quite distinct and independent of each other. Each of these processes runs its course with as much certainty and regularity as any of the diseases which we profess best to understand.

The difference between these two processes as uttered by nature is so clear, that he who reads from that book alone will have no difficulty in recognising the fact. Other local syphilitic actions there doubtless are. These may be modifications of those already mentioned, or may be independent of them. The two typical kinds of syphilitic action above described may be complicated by them or by one another. Such complications are common to all chronic diseases. Fully allowing their existence in syphilitic cases, we may nevertheless be assured that the two forms of local syphilitic affection, of which examples have been given, depend upon distinct and separate actions, and do not in their uncomplicated state give rise to each other.

Now if such be the fact, let us consider for a moment what influence can be produced upon a patient's constitution by the constant re-inoculation of the secretion of the specific pustule. This, as you are aware, has been called "syphilisation;" and that term implies that some effect is thereby produced upon the system. Now if, as in the case first mentioned, one inoculation does not produce any constitutional effect, there is no reason to believe that a second, from the same source, will do so; and if one series of inoculations produce no such effect, we cannot reasonably expect any from a second or a third; or, in fact, from any number in which the matter is derived from the same source. I am aware that it has been mentioned that the process of syphilisation has been carried on by matter derived from different kinds of syphilitic sores; but Dr. Owre, who assisted largely in Dr. Boeck's experiments, has lately told us that in reality the two kinds of matter were mixed together and indiscriminately used. But be this as it may, we have still the broad fact before us, that

the secretion from the specific pustule (however that may have been produced) when taken alone has never been known to produce constitutional symptoms. The uncomplicated suppurating syphilitic sore, whether produced artificially, or whether arising from natural causes (as in the original affection in the case first mentioned), as far as the evidence goes, does not produce constitutional symptoms. It in no way prevents the patient's system from being infected from other sources, but it does not itself produce that infection.

If this be so, there can be little advantage in treating a constitutional disease by a series of inoculations which produce a local action only, and a local action quite different in kind to that which produced the constitutional disease. It is true, that by repeatedly inoculating the secretion of the specific pustule upon a part, an immunity to any further action by inoculations performed in the same way is obtained in that part. If, however, the inoculations be carried a little deeper, or if a fresh portion of skin be inoculated, then a positive result will again be obtained. Or if a certain interval of time be allowed, the same portions of skin in which an immunity has been established will again be susceptible to the inoculations. When a blister is applied repeatedly to the same part, or when tartar-emetic ointment is rubbed again and again upon the same surface, an immunity to its action is by degrees established. The inoculation of the secretion of the suppurating syphilitic sore upon the surface of the skin follows the same law. But none of these agents which produce a local action only can be scientifically used with the expectation that they will cure a constitutional disease; nor, on the other hand, should remedies such as mercury, iodine, and arsenic, which may exercise a prejudicial and permanent influence upon a patient's constitution, be given for a purely local affection.

HENRY LEE.

IV. CASE OF CEREBRAL DISEASE IN A SYPHILITIC PATIENT.

THE recent discovery of morbid states of the central nervous system in correlation with those other phenomena which have long been called syphilis, has excited great interest. Nor, I think, is it possible to overrate the value of these states, and of those other changes in the viscera now grouped with them, and together called quaternary syphilis, visceral syphilis, or the sequelæ of syphilis. On several occasions I have ventured to urge, and would now repeat emphatically, that there is no teacher of nosology like syphilis. No morbid series is so definite, and so apparently coherent; none consists of terms so characteristic; and none can be more distinctly traced in its origin. Even the quite imaginary, and, I venture also to say, quite unphilosophical idea of a “virus,” though now a hindrance to truer conceptions, has been, no doubt, of some value to minds which are incapable of conceiving of a *series* without the instant postulation of some essential cause binding the chain of phenomena together as beads are bound by a string. I do not know that the “virus” hypothesis has greatly vitiated past observations; and on the other hand it has certainly been of some provisional use in confirming the true and valuable idea of continuity. Now, however, that it stands in the way of one of the chief lessons which syphilis has to teach us,—namely, the true meaning of a *morbid series*,—the sooner we can banish it from our minds and our tongues the better. The doctrine of serial evolution, if truly conceived and laboriously applied to the facts of disease, has a great function to fill. Indeed it is the work of the future for clinicians, pathologists, and, I may add, for therapeutists. When we learn—in syphilis, for instance—to dis-

card this fanciful creation of a "virus," and to look upon the infection original to each individual simply as an establishment of the condition of continuity; when we learn that a ✓ syphilitic series is a kind of tissue-evolution—differing certainly in character and in utility, but not in kind, from "healthy" evolution; when, I say, the "virus" fancy and the introduction of morbid poison* has gone the way of the "vital principle" fancy and the insufflation of life,—then we shall be in a position not only to recognise syphilis as actually constituted, but to apply the canon drawn from that knowledge to the construction of other and more obscure series or modes of change, such as scrofula, gout, and others as yet unformulated.

So much sack have I to offer to the reader before coming to the bread. The contribution I have now to make to the real history of syphilis is a small one, though, I hope, not without value. I think it has some decided value both in adding to our knowledge of the remarkable changes already described as occurring in the cerebral arteries of syphilitic persons, and also as a warning to pathologists to examine very closely the state of the brain in all cases of syphilis, or, indeed, for the matter of that, in all cases whatsoever that come before them. It is entirely to the kindness of Mr. Taylor, one of the surgeons of the Royal Artillery, now quartered in Leeds, that I am indebted for the present case. The case indeed is his; and I should set this fact prominently forward, not only because we are all so properly alarmed at the sad tendencies now abroad concerning the rights of property, and the notorious insecurity of such rights as threatened by immoral statesmen and others, but because the value of the case as a complete syphilitic series, and its important clinical characters, had been fully seen and noted by him before I heard of it. The clinical notes of the case which follow are by Mr. Taylor. After the patient's death, Mr. Taylor was so kind as to call and tell me the history, and to invite me to the examination. The examination was made accordingly in June last, at the Leeds Cavalry Barracks, by Mr. Taylor, Mr. John ✓ A. Nunneley, and myself.

* Vide Dr. Gull's excellent and refreshing remarks upon this subject,—Address in Medicine, Brit. Med. Association, Oxford, 1868.

Clinical Notes by Mr. Taylor.

The following fatal case of syphilis may be of interest as exemplifying the persistent effects of the syphilitic poison, eventually causing death by the extension of the disease to the substance of the brain. The case is of unusual value from the completeness of its history and the microscopical observations by Dr. Allbutt of Leeds. The medical history-sheet which accompanies this abstract shows eight admissions into hospital, or 268 days' treatment *in* hospital for syphilitic disease during the last six years. Mercury does not appear to have been administered at any time for the primary syphilis.

On the 14th of May 1868, Driver W. B., R.H.A., æt. 31, was admitted into hospital; he had been attending hospital for some time previous to that date, suffering from "secondary syphilis." He presented a very unhealthy appearance; the bridge of the nose being much flattened and enlarged, and with an abscess forming on each side, near the punctæ lacrymales, connected with the diseased nasal bones; the complexion was very unhealthy-looking, of a muddy pale colour, and presenting coppery blotches here and there on the face and arms; the left tibia was swollen and painful; he suffered from continual headache, and the breath was very foetid. Having much improved under the treatment, which consisted in small doses of iodide of potassium in decoction of cinchona, generous diet, and stimulants, he was discharged to convalescent duty and to continue his medicine, attending occasionally. On the 9th of June he was observed by the non-commissioned officer in charge of the room in which he lived, to be peculiar in his manner; he was lying in his bed undressed, and when ordered to get up, obeyed, but in dressing endeavoured to pass his feet through the sleeves of his jacket in mistake for his trousers. He was at once conveyed to the hospital. I found him semi-comatose, and very irritable when aroused; he answered to the point when shouted at, but not fully, and soon wandered from the subject; the pupils were contracted and sensible to light; there was no paralysis; the tongue when protruded did not incline to either side; the bones of the bridge of the nose were swollen and tender; his hands were restless, and he was continually scratching himself or picking at the bed-clothes; pulse 100, soft and full; he complained of frontal headache. Ordered calomel gr. x. at once; mustard cataplasms to the calves of the legs, and a large blister to the head. In the evening he had become more rational; the blister had risen well, and was dressed with unguentum hydrarg. On the following morning (10th) he had still further improved and answered questions more clearly, but was still stupid, restless, and irritable; the bridge of the nose was very tender, and discharging a small quantity of unhealthy pus from the orifice of the abscess, near the right puncta lacrymalis. A poultice was applied to the part. On the evening of the 10th he had much improved, and

even asked permission to smoke; but on the morning of the 11th partial hemiplegia of the left side had supervened; the excretions were passed involuntarily; the tongue, which he would protrude when loudly shouted to and shaken, inclined to the left side; the pupils were natural in size; there was no heat of the head or change in the temperature of the body in any part; the pulse was 96. Was ordered a blister to the nape of the neck, and to take calomel gr. iij., pulv. opii gr. $\frac{1}{4}$, every third hour. No improvement, however, took place; the paralysis became more complete, the pulse more rapid, the breathing stertorous; the excreta continuously passed involuntarily; and on the 16th of June, at half-past two o'clock A.M., he died quietly.

Post-mortem examination thirty-two hours after death.—Body much emaciated; skin yellow; marks of chancres on the body of penis and glans; slight nodular swellings on the spine of left tibia near its centre; much deformity of the nose, bones thickened at the bridge; the fistulous orifice of the abscess on the right side of nose communicates with the diseased nasal bones.

Head. There was nothing abnormal in the appearance of either the exterior or interior of the skull itself; the dura mater was slightly adherent to the calvarium posteriorly, but not to any great extent; arachnoid and subarachnoid fluid of a muddy colour throughout the right and upper part of anterior commissure. General appearances of brain not abnormal.

Left hemisphere. Healthy.

Right hemisphere of brain. Slight discoloration of the gray substance in anterior lobe, with softening of some small portion of both gray and white substance in the same situation: on slicing-off the hemisphere, a grayish-red gumma (a syphilitic disorganisation) of the size of a small walnut was found imbedded in the anterior and lateral part of right hemisphere.

The other parts of the brain-substance healthy; but the whole length of the "basilar artery" was found thickened, nodulated, and tortuous; and both middle cerebral arteries (the left especially) were thickened, rigid, and gaping when cut; the sylvian arteries also were both thickened and firm to the touch, the right being dense and nodulated to the touch.

Optic nerves. Soft and injected.

Right 3d nerve unusually large and hard (there had been strabismus during life); posterior arteries of brain thickened, but less so than those in front. Cerebellum healthy. Weight of brain forty-seven ounces.

Neck and larynx. The thyroid gland enlarged, the left side hard and nodulated. Larynx: the vocal cords thickened (the voice had been stridulous during life).

The lungs. Collapsed, anæmic, and emphysematous at the edges; the left lung adherent to the diaphragm.

Heart. The pericardium contained four ounces of straw-coloured fluid; heart natural size, a faint white patch ($1\frac{1}{2}$ by 2 inches in size) on the anterior surface; valves rather dense and thickened; a little dilatation and want of elasticity about the commencement of the aorta.

Liver. Adherent on right side to the diaphragm ; there were several whitish patches on the surface and in the substance of the liver, the largest not quite the size of a pea. Weight, fifty-three ounces.

Spleen. Healthy: weight, $10\frac{1}{2}$ ounces.

Kidneys. The left congested and structure confused at some points ; the capsule strips off with difficulty, tending to tear the substance of the gland with it. Weight of left kidney, $6\frac{1}{4}$ ounces. The right kidney appeared healthy, and weighed six ounces.

Testicles. Healthy.

Microscopical Notes by Dr. Allbutt.

Liver.—The changes in the liver were extremely slight, so slight that they would in all likelihood have escaped our notice had the patient's clinical history been unknown. Scattered upon the upper surface of the organ, however, were some yellowish specks, six or eight perhaps in number, and varying in size from a mere point up to the two largest, which were of the size of a large pin's head and of a hemp-seed respectively. On passing the finger gently over these two, or on holding the surface against the light, it was easy to perceive that they rose a little above the surrounding surface of the organ. I made thin sections of the parts of the liver which contained these minute tumours, and mounted them in glycerine and carbolic acid, as recommended by Dr. Bastian.* It then appeared that these little tumours were wedge or cone-shaped processes, the bases of which were the specks visible on the surface. They consisted of amorphous and granular matter, with a very delicate fibroid stroma, a few spindle-cells, and many scattered nuclei and fatty molecules. The upper and broader ends became one with the general capsule, of which they were clearly proliferating processes: beyond the neighbourhood of the spots the capsule was not thickened. Below, they were gradually lost in the cellular elements of the liver, which close around them were undergoing fatty degeneration, and their contents running into drops. The coats of the vessels in the liver, as in other parts of the abdomen and chest, seemed healthy, and there was no distinct excess of vascularity around the little tumours.

Cerebral arteries.—In the brain the usual great changes, such as lumps of syphilitic stuff or softenings of the central

* *Journal of Anatomy and Physiology*, Nov. 1867.

ganglia, were "conspicuous for their absence." There were no adhesions in the fissures; the cerebral nerves and their sheaths, except the second and third pairs as stated, seemed normal; and the brain throughout was of due consistence save for a small extent in the right anterior lobe. Slices were removed in the usual way down to the ventricles, and the striated bodies and thalami were cut across without discovering any obvious mischief: so far from being soft, these centres seemed almost too renitent. After vainly regarding the parts for some little while, and after I had vigorously poked the centres with my fingers, a proceeding which I have often noticed to be most efficient for the detection of softening in parts when softening has been doubtful, we turned the brain over again for a farther examination of its base. We then saw that we had hit upon the secret of the mischief. The cut ends of the internal carotids were standing open like quills, and the basilar artery was as round as if filled with paint-injection. Though there were no patches and no prominences upon the vessels, yet they had lost their healthy hue, and were of a whitish-yellow tint, like cartilage stained of a salmon-colour. Though this tint was deeper in parts, yet there was not much patchy thickening or discoloration, and the appearance was more uniform, and the structure more like cartilage, than we see in common atheroma.

We were surprised and interested to find that this was the condition of every artery and arteriole throughout the cerebrum, so far as dissection with the help of the lens of an ophthalmoscope could tell us; the basilar, the communicators, the anterior, middle, and posterior cerebrals being the most affected. The cerebellar arteries were but slightly, though certainly, changed. The arterial walls were everywhere of varying and abnormal thickness and density. On slitting-up the vessels, the internal coats seemed dense and white, and a few small patches of ulceration were to be seen on the inner coat of many of the larger trunks. Moreover there was a state of almost universal thrombosis. Strings of clot, mostly whitish, tough, and old, but in parts more recent and of a brownish red, extended into the minute ramifications; though there seemed to be always room for some little blood to pass between these axial clots and the walls. Where there were

ulcerations, there clot was adherent to the walls; but, as I have said, these ulcers were few and small, and were confined to trunks of the first and second magnitudes.* I immersed arteries from all the encephalic regions in alcohol for some weeks, and then made long and cross-sections of them, treating the sections with turpentine and mounting them in balsam. The morbid appearances were very interesting and decisive. Both the long and cross-sections showed great inequality in the thickness of the walls and of the several coats, the entire walls and the separate coats being in some places two or three times as thick as in other parts. This change was due to a chronic arteritis with great nuclear and cellular proliferation, and affecting all the coats to some extent, but especially the middle and inner coats. The distinction between the coats was in many places lost; in other places the inner was detached from the middle coat by a nest of nuclei and granules; in other places the surface of the inner coat was wholly gone, and presented a rough and irregular outline, or actually presented microscopic ulcerations; in other places, again, pear-shaped processes, thrust inwards from the middle and inner coats, projected into the lumen of the vessel, carrying the inner coat before them. It was easy to see in many sections that the small ulcerations were formed by the budding out of these pouches and their subsequent detachment. Their contents were chiefly of an opaque granular character. I found, however, no dark layers of fatty degeneration like those we see in common atheroma; and on the whole the degeneration was not of so low a kind as in atheroma, the products being generally of higher physiological value. In order to examine the minuter arterioles, I made thin sections in various directions through the white and gray substances, treating the sections on Clarke's method. I found them everywhere diseased, their walls being the seat of active nuclear proliferation, so that the arterioles, when stained with weak carmine, seemed in many places to be swarming with these little bodies. In many sections I observed a most beautiful pathological injection of the perivascular canals of His, which I exhibited to the Leeds Medical Club at its September meeting. "Exuda-

* I mean ulcers large enough to be seen by the naked eye.

tion had taken place" into the perivascular canals of a transparent material, which in some lights, and with a power of about 300 diams., showed a fibrillar structure; this had distended the canals, and demonstrated them as clearly, or more clearly than an artificial injection could have done. It was very curious and interesting in many instances to see the diseased arteriole, knotty, tortuous, or shrivelled, lying in the course of the containing tube.

Meninges.—In the meninges I found the disease of the arteries less distinct, but there was more tendency in them to the accumulation of separate morbid deposits. After detaching thin pieces of membrane from the cloudy portions, I floated them on turpentine, and afterwards placed them in balsam. On examining these portions with a power of about 100 diams. or less, I saw numerous opaque masses or agglomerations besetting the vessels. These microscopic tumours seemed to be of a granular structure, and they often imbedded or rode upon three or four little branches at a point of ramification, or in other places they invested a trunk, to which they gave a clubbed appearance. The vessels were thickened a little in many places, and their contents almost everywhere coagulated, as in the brain. These little scattered tumours, and their relation to the vessels, reminded me very strongly of that distribution of points of tubercle about the vessels which has lately been demonstrated. I am sorry to say that I cannot tell from what parts of the surface these bits of arachnoid and pia mater were taken, as I had carelessly thrown a few shreds into my bottle without noting their position.*

Cerebrum.—Of the cerebrum itself I made a large number of sections, taken from various parts, and chiefly from the anterior half of the right hemisphere. None of these sections gave me the idea of a really normal brain-tissue, though

* This was one piece of carelessness; another was, that I did not examine the state of the carotids or vertebrals; and thirdly, and worst, that I did not bring away the right corpus striatum for minute examination. I shall find no excuse for all this except from readers who have made many autopsies themselves, and are familiar with such phases of human frailty. It is scarcely needful, perhaps, to draw attention to the importance of this meningitis, as showing that in syphilitic cases we find simple and primary degeneration of the meninges, as well as mischief extending to them from the periosteum.

many showed no definite disease. There was a tendency, however, in most parts to distinctness of nuclei and granules, and to irregularity and indistinctness of the nerve-fibres. The sections were, however, very carefully prepared, some by Clarke's process, others by Bastian's carbolic-acid process, after hardening for three or four weeks in weak chromic solution. But I also found distinct evidence of disease in other sections, as shown by the undoubted presence of many nuclei, "amyloid" bodies, fatty granules, and broken-up fibres. Elsewhere I saw blood-crystals embedded in amorphous matter, the remains apparently of minute extravasations. These patches of disease were most frequent near the district of softening in the anterior lobe, though they were by no means confined to that part, but occurred in other parts of the right anterior and middle lobes. The slate-coloured mass embedded in the anterior lobe did not, I think, prove to be gummatous in character. It did not extend to the surface of the brain, the surface above it was not depressed, nor, again, had it a glistening or smooth surface on section, but roughened, so that the cut surface appeared coarse and granular when held up to the light. Under the microscope it showed abundance of nuclei and broken-up brain-tissue, a few blood-crystals, a quantity of amorphous matter, and diseased capillaries. There was no trace of uninjured nerve-fibres or cells, nor any of Robin's "myelocytes." The formation seemed to have some kinship with a glioma, though it contained a much larger quantity of the products of cerebral degeneration.* Lastly, the simply softened parts of the brain, which were not extensive, differed in no way from the usual appearance of such parts.

Throughout the brain, membranes, and vessels, then, though I found abundance of disease, yet I found no structure of a gummatous character, and nothing that could be recognised as nodose or specifically syphilis, unless perhaps the specks in the arachnoid were gummatous. Hence the morbid anatomy differs from that of the well-known cases published by Lancereaux, Wilks, Bristowe, Reade, Hughlings Jackson,

* It is sometimes difficult, as I since find that Virchow himself has pointed out, to distinguish between ill-pronounced forms of cerebral gumma, glioma, and other such heteroplasia.

Moxon, and others. I have run my eye over all these cases, and over some others to which Dr. Jackson has kindly referred me, but without finding a similar example. In Mr. Taylor's case there was in the brain a universal chronic arteritis with secondary and consequent deterioration of brain-tissue. This condition coincided with a remarkably complete syphilitic history; and it will be therefore of great interest to us to see whether a like state of things will be found in other such cases. Of one thing I am quite sure, namely, that many such brains are recorded as "healthy."

With regard to the *cerebral nerves*, the third nerve was simply thickened and condensed by increase of its connective tissue, and its nervous fibres consequently atrophied. There was nothing distinctive in that process; but it is interesting when taken with the clinical fact that the third nerve is so often affected in syphilis. The optic nerves are as yet unexamined, as I have set them aside with others for another and a wider inquiry. I have already published my belief* that an optic atrophy, evident to the ophthalmoscope, but not causing any great loss of vision, is frequently associated with disease of the cerebral blood-vessels, and is important evidence in cases where such degeneration is suspected. It is sufficient at present to say that the optic nerves in this instance also are evidently, though not extremely, degenerated. [Vide Mr. Taylor's notes.]

T. CLIFFORD ALLBUTT, M.D.

Postscript.—I may quote the following from a letter I lately received from Dr. Wilks:

"I believe I have seen two or three undoubted cases of syphilitic disease of the arteries. In all probability it is not uncommon; but the change in the vessels not being a characteristic one, I cannot speak with certainty. For example, a considerable thickening of the coats of the ascending aorta in syphilitic subjects I have on more than one occasion suspected to be syphilitic; but as the same condition may arise under other circumstances, I have been cautious in assuming the cause. In the first case I published, and in one or two subsequent cases, the patients were young, and the change was peculiar; not the

* Vide *Brit. Med. Journal*, June 20, 1868; and *Medical Times and Gaz.* July 1868.

ordinary atheromatous changes within or simple thickening of the cellular coat, but a distinct nodulation in various parts of the vessels—that is, irregular deposit of a low formed inflammatory material scattered through the fibrous sheath. The vessel had not the uniformity produced by a simple thickening, but had, when dissected out, a remarkably irregular outline, looking more like a vein from an old subject in which a calcareous change has taken place.” [This agrees very nearly with the appearance of the brain-arteries in my case, though the irregularity was less well marked. T. C. A.] “My successor Dr. Moxon has shown me cerebral arteries with distinct nodes on the walls, very different from the appearances produced by ordinary disease. Hughlings Jackson has also published cases. In my first case (now some years ago) the whole cerebral arterial system was affected, with the carotid and vertebral trunks.”

Numerous cases are now on record in which nodes, or excrescences, have been found on the cerebral arteries. The question now to be answered is, whether arterial disease, interstitial and not of a nodular kind, is to be recognised. Virchow gives a case of a girl of 18 who died highly syphilitic, and in which he found the aorta “studded with sclerotic and atheromatous patches” (*Krankh. Geschwul.* II. ii. 442); and he says, on the previous page, that he has even remarked that a “gummosus inflammation of the vessels presents no slight resemblance to the endoarteritis deformans which leads to sclerosis and atheroma.” On the same subject see also Virchow, *Archiv*, bd. xv. s. 324.



V. ON THE REDUCTION OF OLD DISLOCATIONS.

THE use of chloroform compels us to reconsider and modify opinions on various questions relating to operative surgery; and especially it is necessary to do so in those cases where the muscles are directly concerned in fixing a limb. Now that the influence of the muscles can be temporarily removed, we may well ask ourselves if the limits to the reduction of old dislocations which formerly obtained should still be adhered to.

It was laid down as a law by Sir Astley Cooper, that in dislocations of the hip attempts at reduction should not be made after eight weeks of displacement, and in those of the shoulder after three months. This, as everyone knows, was written before the use of chloroform was understood. In the latest surgical works bearing on this subject, however, the same opinions are expressed and the same limits adhered to. Thus, Sir William Fergusson, on dislocations of the shoulder, says: "I have myself failed in the fourth week, while again I have been successful on several occasions in the eleventh; and though cases have been put to rights even after the third month, the propriety of interfering with the generality of such instances may admit of doubt. I shall only, therefore, add the views entertained on the above important question by one of the greatest of all authorities on the subject, Sir Astley Cooper, who, in the preface to the posthumous edition of his work on *Dislocations and Fractures* (1842), has left behind him the following statement, grounded, it must be kept in mind, on an experience greater perhaps than ever fell to the lot of any other individual: 'I feel,' says he, 'that my professional brethren will be disposed to think that I have limited to too short a period the attempts at reduction. It has been stated that dislocations have been reduced at four, and even at six, months after the injury; and this assertion I am not disposed to deny; indeed, I have myself had an opportunity of witnessing examples of the fact; but excepting in very emaciated, relaxed, and aged persons, I have observed that the injury done in extension has been

greater than the advantage received from the reduction ; and therefore, in the case of a very strong muscular person, I am not disposed after three months to recommend the attempt, finding that the use of the limb is not when reduced greater than that which it would have acquired in its dislocated state. Let this be fairly represented to the patient, and then, at his request only, the reduction should be attempted ; but with all appliances and means to boot the extension must be very gradually made, and without violence, to avoid injury to the muscles and nerves.' ”*

Mr. Erichsen says: “The *latest period* at which reduction should be attempted varies much, according to the nature of the dislocation. It may be successfully practised at a much later period in luxations of the orbicular than of the hinge joints ; and it is especially in the shoulder that these late attempts may be successfully undertaken. According to Sir Astley Cooper, the latest period at which reduction even in this articulation can generally be successfully effected does not exceed three months, and eight weeks for the hip ; but within this time it may often be safely accomplished. Thus, Dupuytren reduced twenty-three cases of dislocated shoulder between the fifteenth and the eighty-second day after the accident ; and Breschet reduced the hip on the seventy-eighth day. At a considerably later period than this, however, the luxated bone has been put into place. Thus, Smith, of the United States, reduced one dislocation of the shoulder at the seventh month, and another at ten and a half months. In the reduction of some of these old-standing dislocations, it has been proposed to divide by the subcutaneous section those muscles which appear to offer the greatest obstacle to the return of the bone. In this way Dieffenbach has succeeded in reducing a dislocation of the humerus two years after its occurrence. In some cases, however, as I have more than once witnessed, this plan does not succeed, owing evidently to the existence of contractions in, and adhesions between, other tissues than the muscular, and to the changes that have taken place in the articular surfaces, preventing the head of the bone being replaced or retained in its proper position.”†

* *A System of Practical Surgery* (4th ed. 1857), p. 246.

† *The Science and Art of Surgery* (3d ed. 1861), p. 264.

Again, Professor Miller wrote: "In regard to old dislocations an important question arises as to the time at which attempts at reduction cease to be warrantable. Some joints are more favourably situated than others in this respect. Hinge-joints, as the elbow, are with difficulty reducible after three or four weeks have elapsed. On the other hand, a ball-and-socket joint, as the shoulder, may be practicable after almost as many months."*

Now, when dislocation has occurred and the capsule is rent, inflammatory thickening around the extremity of the displaced bone takes place, adhesions form, and ultimately a new capsule is developed. "In orbicular joints," as Professor Pirrie says, "the very form of the bone gives a facility of moving; and if the displaced head rests on a muscle, the muscle becomes dense, hollow, ligamentous, smooth, lubricated, and of a suitable form for its reception. If it rests on a bone—as, for example, on the ilium or scapula—a cavity is formed to receive it, partly by absorption of part of the bone on which it rests, and partly by the deposition of new bone; and the cavity is either lined with a dense ligamentous matter, or covered with a porcellaneous deposit."† The surrounding cellular tissue becomes condensed, and at length is formed into a new capsule, which by motion is perfected. It is furnished with a smooth lubricating lining, and permits in many instances of very free movements of the limb.

But, on the other hand, when the extremity of the bone is displaced in such a manner as to press on neighbouring vessels and nerves, the pressure in itself occasions pain, and motion is so painful that the limb is kept in a fixed position. Without motion, however, a new joint is not developed.

Thus, in old dislocations, two distinct conditions are observable. On the one hand, nature remedies the effects of an old dislocation by the development of a new and more or less perfect joint; while on the other hand, adhesions and consolidation take place around the extremity of the bone, which have a tendency to fix the limb and prevent motion. In the former case the limb daily gains strength, as

* *The Principles of Surgery* (3d ed. 1853), p. 709.

† *The Principles and Practice of Surgery* (2d ed. 1860), p. 300.

the new joint is perfected ; but in the latter atrophy of the limb results.

In the treatment of old dislocations these conditions should be considered — namely, the amount or absence of repair, rather than the period during which the limb has been dislocated. For although it may always be a question to decide whether it is desirable to attempt the reduction of a limb which is regaining motion and power, or which has in great measure regained power of motion, within certain limits it can scarcely be wrong to attempt the reduction of a dislocation so long as the limb remains motionless or whilst it is motionless and painful.

The mode in which reduction of an old dislocation should be proceeded with, that the operation may have a successful issue, is of great importance. I will relate two cases as examples of successful reductions of long-standing dislocations, which will together illustrate perhaps every point that it is necessary to consider.

It is doubtful if the capsule is ever an obstacle to the return of the dislocated bone. Certainly the altered shape of the head of the bone never can prevent the return of the head to its articular cavity. And it is probable that where the articular cavity is partially obliterated, it is the result of extraordinary violence and consequent inflammation. I have found the cotyloid cavity retaining its depth and covered with cartilage after the head of the femur had been dislocated for three years. And Fournier has placed a dissection on record where the head of the femur had been dislocated during thirteen years, and in which the acetabulum retained its form and depth and cartilage.*

Chloroform having been fully administered, the adhesions around the extremity of the bone are to be ruptured by free movements of the limb, and these having been separated, the dislocated bone will be replaced by traction and manipulation, and without extension and the use of the pulleys. In some cases it is necessary to have recourse to the subcutaneous section of tendons before proceeding to reduce the dislocation ; and when this is done, the punctures should be allowed to heal before attempts at reduction are made.

* *Bulletins de la Société Anatomique*, 1855.

Some time ago, I saw, with Mr. Chalk, a patient, fifty-three years of age, who had fallen from a height of twenty feet and dislocated the humerus beneath the pectoral muscle. The swelling was considerable at the time, so that the dislocation was not discovered by the surgeon who first saw this patient; but afterwards, an attempt at reduction was made, which, however, was not successful. Four months later, he presented himself at a large metropolitan hospital, that an attempt at reduction might be made. He was persuaded, however, not to submit to any attempt to replace the head of the bone. Two months after this, I saw him. He was suffering acutely, and was unable to move the limb, or to carry it without support. Any attempt at motion caused excessive pain, especially about the neck of the humerus and in the region of the elbow.

The head of the humerus could be distinctly felt lying beneath the pectoral muscle, where it appeared to be firmly fixed. The deltoid, biceps, and pectoral muscles especially were atrophied; but also the whole limb was wasted. The fingers were numb. The elbow was somewhat removed from the side, and was inclined backwards, where it was fixed and immovable; the forearm was flexed, and the hand was carried forwards.

Under these circumstances, we determined to endeavour to replace the head of the bone; and although the humerus had been dislocated now for 175 days, we considered ourselves justified in making the attempt at reduction. The patient was therefore placed completely under the influence of chloroform, and the scapula was firmly fixed both laterally and from above. The adhesions about the head of the humerus were then broken up by to and fro motions of the humerus and by freely rotating the head of the bone. Then seizing the wrist, I drew the arm directly upwards, when the head of the humerus immediately slipped into the glenoid cavity with a slight click. A pad was placed in the axilla, and the arm was bandaged to the side. The patient remained in bed for three days, and on the sixth day the bandages were discontinued, and gentle motion was commenced. There was no disposition at any time for the bone again to become displaced.

After some considerable time, the power of motion was in great measure, if not entirely, restored; pain and numbness ceased, and there was no difference in the fulness of the two shoulders; so that when I last saw him, this arm was almost as useful as the other.

On the 8th of July 1868, Elizabeth Costin, nineteen years of age, was admitted into the hospital with an old dislocation of the wrist forwards. This dislocation resulted from a fall on to the palmar surface of the extended fingers, and it occurred six years before her admission into the hospital. The wrist and fingers had entirely lost all power of motion. On the day after her admission into the hospital, the flexor tendons, namely those of flexor carpi radialis, palmaris longus, flexor sublimis, and flexor carpi ulnaris, were divided subcutaneously; and four or five days later, the punctures having healed, chloroform was administered, the adhesions were ruptured, and the hand was restored to its normal position by flexing and subsequently extending the hand upon the forearm. The limb was then laid upon a straight splint and bandaged firmly to it. After some few days passive motion was commenced, and for this purpose an instrument was constructed with a joint corresponding to the wrist-joint, which supported the extremities of the radius and ulna and the carpus, and which allowed of motion without displacement of the wrist.

In old dislocations, then, recourse is to be had to manipulations, with or without the previous subcutaneous sections of tendons, rather than to the pulleys and violent extension of the limb. Violent extension may occasion rupture of vessels and nerves, as well as of the integument and the muscles; it may even occasion fracture. But these accidents cannot occur when manipulations are employed to restore the limb after the adhesions have been ruptured. When, as in the cases now related, there has been little or no attempt at repair, and where the limb remains not only motionless but painful, recourse may be had, even at a very late period, to the means above detailed to restore the position of parts and the motion of the joint.

BERNARD E. BRODHURST.

VI. ON TRAUMATIC FEVER.

SOME most important and original observations on the subject of traumatic fever were published two or three years ago by Dr. Th. Billroth in Langenbeck's *Archiv für Klin. Chirurgie*; and it was in consequence of a perusal of those researches, that I was induced to make a series of observations on this same subject while holding the office of Surgical Registrar to St. George's Hospital, in order to confirm the statements of Dr. Billroth, and, if possible, to add something to the knowledge he has given us.

My observations extend over a period of six months, and during that time the accurate state of the majority of serious wounds admitted into the Hospital was recorded, as far as possible, twice a day; but since, owing to unavoidable circumstances, this was not always practicable, it has been found necessary to exclude a large number of cases, inasmuch as the observations are not complete; so far, however, as they go, they serve to confirm the results derived from the remaining cases. After a careful analysis, I find that I have records of 108 cases where the state of the patient has been taken from the time of admission to the date of the discharge of the case. And it should be mentioned at once that no case is recorded in which the wound was not quite recent, or in which it was not seen from the commencement. It may be mentioned also that in the following remarks, though the thermometer will be usually spoken of as the index to the patient's state, and the greatest stress will be laid upon this instrument as a means of diagnosis, other symptoms also were noted, such as the state of the patient's pulse, tongue, and skin, and character of the excreta.

Concerning the symptoms of an ordinary attack of trau-

matic fever, little or nothing need be said, as they have often been fully described, and differ in nowise from the ordinary phenomena of general pyrexia : thus, the pulse becomes quick and sharp, the skin hot, and the general temperature of the body augmented, while the tongue is foul and furred, and there is restlessness and inability to sleep. It is with the modifications that it undergoes that we are more especially concerned. And it may be remarked that the character of the wound has nothing whatever to do with the nature and extent of the fever, or indeed with its presence or absence ; for in many cases where the wound was of great magnitude, the fever was very slight, or altogether absent ; while in others where the wound was regarded as trivial in character, the fever was well marked and ran a severe course. This, however, may, to a certain extent, be accounted for by the constitution of the patient, or disease of the internal organs, more especially disease of the kidney, rendering the sufferer more liable to these attacks. Taking the total number of 108 cases which have been tabulated, it is found that in thirty-five there was a total absence of all symptoms of a febrile nature, or, at all events, they were of so slight a character as entirely to elude observation, and to produce no appreciable difference in the thermometer or in the nature and frequency of the pulse. And among these thirty-five cases were several wounds of a very severe description, including, among others, an amputation of the leg, two compound fractures, and an amputation of the breast ; whereas several wounds of a comparatively slight nature were followed by very severe symptoms.

The attack usually comes on about the second or third day, though in some cases it was found to be delayed to the fourth or even the fifth day. In no single instance did it occur after the fifth day, and in some cases it occurred within the first twenty-four or forty-eight hours. In no case was it ushered in by a rigor, though once or twice chilliness was complained of. The fever augments very rapidly ; in one case the temperature reached its maximum, an increase of 6° F. in twenty-four hours ; the general period is about two days. The whole course lasts from two to six days, and the fever subsides gradually ; the temperature decreasing with as great

rapidity as it augmented, and the frequency of the pulse declining in proportion to the decrease in the temperature of the body.

Such, then, is briefly the course of an ordinary attack of traumatic fever, which comes on, runs its course, and disappears, leaving the patient in much the same state as he was previous to the seizure. But there is a more important point to be considered, namely, the relation which the fever bears to the wound, and one to which I would wish to draw special attention, as it is often very striking and most important. In most cases it will be found that the acme or greatest intensity of the febrile attack usually precedes some important change in the condition of the wound. In most of the cases in which the wounds suppurated, the highest temperature preceded the establishment of suppuration by about twelve hours. In fact, on looking over my notes, I am surprised at finding the frequency with which the following state of things is recorded. The temperature three or four degrees above the normal standard—the maximum temperature throughout the case—and the wound described as dry; and at the next note, twelve hours after, the temperature very considerably fallen, the pulse quieter and less frequent, and the tongue cleaner and moister, and the note on the condition of the wound stating that suppuration is established.

To quote only one instance :

A man was admitted with a severe lacerated wound of the hand, with fracture of the metacarpal bones, from a machinery accident, for which primary amputation at the wrist-joint was performed. On the evening of the third day after the operation his temperature was 104.6°F. ; his pulse was 110 throbbing; his tongue furred and his face flushed, and the wound was dry and glazed. The following morning the temperature was 100°F. ; the pulse 84, soft and compressible; and the wound was discharging healthy laudable pus.

Another point in which the febrile symptoms bear a very close relation to the condition of the wound, is in the fact that any sudden increase of temperature always denotes some important change about to take place in the wound. I cannot better exemplify this than by briefly recording a case.

E. M. was admitted on November 9th with a severe injury to the hand, for which amputation of the forearm was at once performed.

On the evening of the 10th the temperature was 99.6° F., and the wound quiet and comfortable. The following morning the temperature was 104° F., and the wound was stated to be comfortable, but could not be examined, as the first dressings had not been removed. In the evening of the same day (11th) he had inflamed absorbents all up the arm as far as the axilla, and an enlarged gland in this latter situation; the pulse was 96, sharp and incompressible; the skin felt to the touch burning hot and dry, and the tongue was very white, the urine being loaded with lithates. He complained of great pain. In twenty-four hours the temperature had diminished four degrees; and on the morning of the 13th, thirty-six hours after the commencement of the diminution of the fever, my notes say, "A faint streak of redness only visible." The normal temperature was reached on the third day.

In the same manner the fever denotes and precedes many other important changes which take place in wounds, and would appear, from the cases collected, to be a tolerably safe and certain premonitor of some unhealthy action about to be set up in the affected part; but I shall have occasion to revert more especially to this subject when I come to speak of the secondary forms of fever.

It should be borne in mind, however, that the fever following wounds may undergo various modifications from extraneous causes; and of these the principal may be summed up under the four following heads: 1st. In the case where febrile excitement has been set up by an injury which has caused a violent shock or concussion to the system, the course of the fever may be much modified, and is usually of an ill-defined and remittent type. This was well exemplified in a patient who was admitted with a compound fracture of the leg, having been run-over by a wagon. The man was admitted in a state of extreme collapse, having received a severe contusion of the abdomen as well as the compound fracture. This patient had traumatic fever; but it was never well defined, the temperature was never very high, and varied exceedingly, and his general symptoms presented more of what would be called the irritative type. 2d. The fever may be, and generally is, modified in cases where it occurs in a constitution in which the nervous system has been habitually influenced by peculiar stimuli, such as alcohol taken in excess. 3d. The fever is modified in the case of inflammation attended with the introduction of peculiar animal poisons into the system: and, 4th, it is modified in the diseased; though

unfortunately on this point I can say little or nothing ; nevertheless it is one which is of paramount importance, since a knowledge of the modifications produced by such diseases as, for instance, phthisis, or albuminuria, or disease of the liver, in their early stages, would guide us in a great measure in determining the admissibility or inadmissibility of any operation. In all these cases, however, as far as my investigations go, I find that the fever attending wounds in the diseased shows a less forcible and less enduring reaction, and is attended with more derangement, both of the secretions and of the functions of the nervous system, than is usual, and therefore assumes more or less exactly the form to which the term "typhoid" is applied.

In an uncomplicated case, however, the fever may come on, may run its course and may subside, leaving the patient in much the same state as he was previous to the attack, and with a perfectly normal temperature. But we are not therefore to assume that the case is complete; for it has been found in some instances, after a normal temperature has been maintained for twenty-four or forty-eight hours, or even for a longer period, that the thermometer again rises, and contemporaneously with it there is increased rapidity of the pulse and other febrile symptoms. This fresh accession of fever has been termed by Billroth "secondary fever," and is of the very greatest significance, denoting some important change about to take place either in the condition of the wound or the general state of the patient of the gravest nature.

It has been stated by Billroth that this secondary fever may come on without any primary attack, and that in all cases where the first symptoms of the fever are delayed beyond the eighth day, they must always be regarded as "secondary" in their nature. But in all those cases observed by myself, there was, in every one where this secondary state supervened, the history of a previous attack, though in some cases it was comparatively slight, and lasted perhaps only for some twenty-four hours. In some cases, however, it was noted that the temperature never regained its natural standard between the primary and secondary attack, but that the former merged into the latter, so that it was impossible to

say where the one terminated and the other began. In this respect Billroth's rule holds good, that the fever, when prolonged over the eighth day, must be regarded as secondary; especially because, as was stated in a former part of this paper, the primary fever is never continued over the eighth day. It will be seen, therefore, that there are no symptoms in the traumatic fever to guide us in assuming that there will be a secondary attack.

It has been said that this "secondary fever" denotes that some important change is about to take place either in the condition of the wound or in the general state of the patient. In the former of these cases, where the change was local, it showed itself in the form of inflammation of the subcutaneous and intermuscular connective tissue, or diffuse cellular inflammation: in the latter, where the change was constitutional, in the form of pyæmia, phagædena, or erysipelas.

First, then, to consider the cases in which there was secondary fever followed by local inflammation. The period between the first attack and the second varied from twenty-four to forty-eight hours. The defervescence of the first attack was coincident with the formation of pus; the commencement of the second preceded the swelling and tension of the limb, and immediately diminished with the free exit of the matter, either by incisions or by its finding its way to the surface and bursting. Thus a very intimate connection can be traced between the local and general symptoms. And from this it is perfectly evident that the course of the fever must vary with the rapidity with which pus is formed and a free exit obtained; another reason, if any be necessary, why a free and early incision should be practised in these cases.

In the instances in which the secondary fever is followed by some change in the general state of the patient, its course is different in the various forms of disease set up, namely pyæmia, phagædena, or erysipelas, but presents a very constant type in each of these three cases.

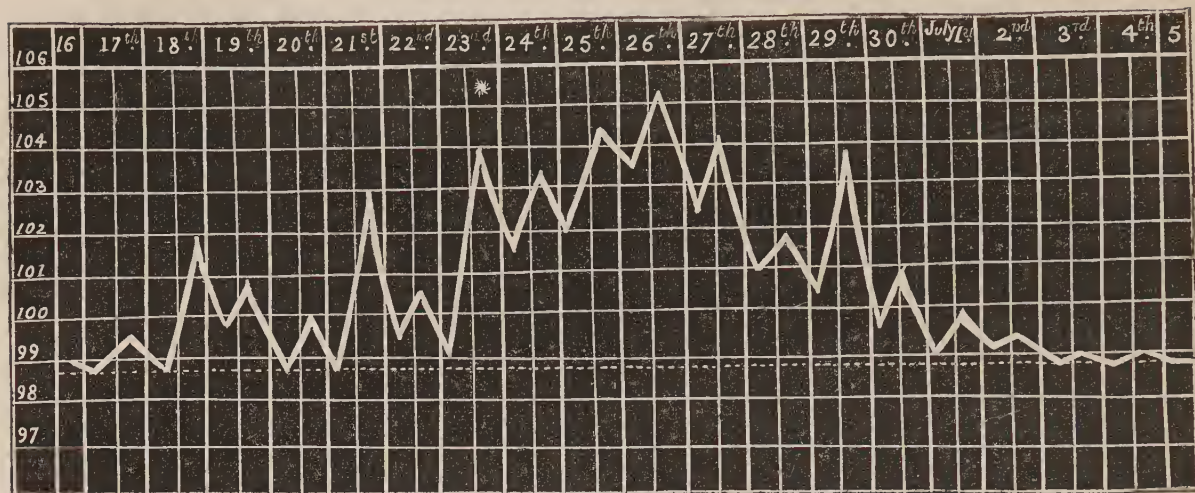
In *pyæmia* the fever is well marked, and presents some striking features. It is what may be termed of a remittent type; that is, there are distinct intermissions, the temperature becoming normal, or approaching to this standard, and the pulse becoming quieter and less rapid, and then again rising.

The secondary fever passes into the remittent type gradually, so that the patient has rarely a normal temperature when pyæmia occurs; the intermittent type of fever always precedes the rigors, and thus it becomes an earlier premonitory sign. The evening exacerbations are generally well marked, and there is always a normal or unnaturally low temperature just before death. Thus in a boy who underwent amputation and died of pyæmia, the temperature, which after the operation was never below 100·6, fell just before death to below the normal standard of the human body. The following case illustrates very fairly this peculiar condition of the temperature.

A little girl, Olivia W—, aged 13, was admitted with diseased hip, for which excision was performed on October 27th. The primary fever commenced on the second day, and subsided on the fourth. Secondary fever appeared on the fifth day, and a normal standard was almost, not quite, gained on the morning of the seventh day; on the evening of the same day there was a fresh exacerbation of the fever, and this was coincident with the first rigor. The following day there was a still higher temperature; and on the ninth day the thermometer was 98° F., below the natural standard, denoting approaching death. She died the same evening. Her principal general and local symptoms were an extremely sloughy state of the wound; repeated rigors after the first; profuse sweating; a yellow tint of the skin; an extremely weak and quick pulse, and constant sickness and restlessness. No post-mortem examination was allowed.

It has been shown by Billroth that metastatic inflammations are connected with exacerbations of the fever or rigors, and that when the inflammation is in process of evolution the fever always increases, and that not unfrequently a distinct attack, with rigor, is excited. On this point I have not had sufficient opportunities of satisfying myself; but it is, reasoning from analogy, most undoubtedly true. For as the fever is coincident with the formation of pus, as was pointed out previously in the cases where local changes were observed, so we can easily understand that the metastatic inflammation of an internal organ, a joint, or the subcutaneous cellular tissue, would be characterised by an exacerbation of the fever in cases where the exact condition cannot be so readily ascertained. Subjoined is the thermograph of a favourable case, which exemplifies very well the various points alluded to, the

observations being made in the axilla at the hours of 8 A.M. and 7 P.M.



* The date of first rigor.

The case was that of a man, Aurelius B—, æt. 22, who was admitted with disease of the spine and psoas abscess, and in whom, on June 16th, a seton was passed through the abscess. On June 23d he had a rigor, and these rigors were constantly repeated; he had a foul tongue, and very rapid pulse, with profuse sweating. On the 26th he had effusions into both ankles, and on the 27th into one knee.

After this the symptoms began gradually to disappear, and the swelling of the ankle subsided. It will be seen that the temperature presented four distinct intermissions, the acme or greatest intensity of the first occurring two days before the first rigor, the second being coincident with the first rigor, the third taking place at the same time as the swelling of the ankles, and the fourth three days later. The temperature then gradually assumed its natural standard, contemporaneously with the diminution of the heart's action, the cessation of the sweating, and the cleaning of the tongue.

In *phagædena* the course of the fever is very different to that which has been already described as occurring in pyæmia. Here also the fever takes a very peculiar course, and one which appears to be pretty constant. Upon referring to the literature on this subject, there will be found to be great discrepancy of opinion. Thus Blackadder, who wrote in 1818, asserted that this disease was at first purely local, and was unaccompanied by any general symptoms; but this is totally at variance with the recorded observations of more recent writers. Dr. Macleod states that after the storming of the Redan, in June 1855, they lost many cases

from phagædena, and that in all febrile symptoms ushered in the attack; and Dr. Hennen's account of hospital gangrene, as it occurred during the Peninsular War, corresponds in all essential particulars with Dr. Macleod. In a paper which I published some years ago in the *British Medical Journal*,* on an epidemic of phagædena which occurred in this hospital, I there state that no well-marked fever ushered in the disease, and that the only premonitory sign which was observed was, in some cases, a total cessation of pain some twenty-four hours prior to the attack. More extended observation, however, and especially the use of the thermometer, has led me materially to modify my views; and I think that I shall be able to show satisfactorily the source of error, and to explain the very great discrepancy of opinion which, as I have stated, exists on this point.

The secondary fever in those cases of phagædena in which I noted it, was extremely well marked, *the thermometer standing remarkably high*. But the cases possessed this peculiarity, that whereas in the ordinary defervescence we have a gradual diminution of the temperature until it reaches its natural standard, in cases about to be attacked by phagædena we have a sudden fall in the thermometer from its "fastigium," or highest point, down to the natural temperature or even, as was observed in one case, below it. Thus we shall have a patient who, twenty-four hours after the cessation of the traumatic fever, shall have a gradually-increasing temperature up to, let us say, 105° or 106° F.; then, between one visit and the next, the temperature will have fallen to 98° F.; and twenty-four hours after the wound will be phagædenic. It was by noting this fact that I was able to prognosticate an attack of phagædena in a case of amputation of the thigh, where the surgeon in attendance declared the wound to be in the healthiest condition possible. Thus, I think, we have some explanation of the great discrepancy of opinion. By some the fever was looked for immediately prior to the attack; whereas, as I have shown, no fever exists at this time. It must be looked for some short time previously to the first appearance of sloughing. This observa-

* Vide *British Medical Journal*, vol. i. 1864, p. 262.

tion bears out too the fact noted in my former paper concerning the cessation of pain some time prior to the attack.

Concerning *erysipelas* I can say very little, inasmuch as from my present experience I have not found that the fever presents any typical form. For the most part the fever precedes the appearance of the eruption by a very short time: it continues high during the whole course, and subsides rapidly. More than this I have been unable to ascertain.

In conclusion, it must not be supposed that I am inclined to lay too much stress on these varieties of the fever, and to affirm that we are entirely able to predict this or that disease from the form that it takes. But, at the same time, the subject seems to me to be one of interest and importance, on which more accurate data and more extended observation may lead to some definite results. In the present state of our knowledge I think we are justified in stating that a patient who, after a well-marked primary attack of fever, remains free for some days from a secondary attack, is little liable to these diseases; and, on the other hand, where this secondary fever does supervene, the very gravest results must be anticipated.

THOMAS P. PICK.

VII. ON PARALYSIS OF THE EXTENSORS.

IN the last volume of the *Transactions of the Royal Medical and Chirurgical Society* will be found the details of the few cases of this rare form of paralysis which have been under observation in this Hospital. To these may be added another case which presents the same features as those already recorded, the paralysis in this instance being in a very early stage, and confined to one foot.

Hitherto I have been unable to find any cases recorded which exactly tally with those described in the paper above referred to : cases, that is to say, in which the disease seemed to be due to organic disease of the spinal cord. In the single instance in which I was able to ascertain the condition of the body after death, the spinal cord was the only part found altered, and this alteration was of a most remarkable kind. As a post-mortem examination has been made in only one instance, it would be hazardous to affirm that the pathology of the disease is of exactly similar nature in all the cases ; but in the face of this instance it is impossible to accept the suggestions of hysteria and cerebral disease in explanation of the curious train of symptoms presented by this form of paralysis.

On reference to Todd's Clinical Lectures, it is quite clear from a passage in the volume on *Diseases of the Brain* (p. 344), that he recognised no special lesion of the nervous centres which can produce paralysis of the extensors. In speaking of a case of lead-palsy, he says there : " I do not think that the palsy can be attributed to any special lesion of the nervous centres. I know of none which would produce exactly this form of paralysis so symmetrical, affecting particular classes of muscles in preference to others."

In Romberg's work on *Diseases of the Nervous System* (p. 371, vol. ii.), the following passage indicates that he was

aware that this form of paralysis is not always due to lead. "It is not always," he says, "that lead-poisoning gives rise to this particular form: it is met with in individuals where the most careful examination fails to show an influence of this kind; but in this case it is not limited to nor does it affect the extensor muscles only, but also attacks the flexors. It is uniformly accompanied by atrophy, while sensibility generally continues unimpaired."

This last condition which Romberg attaches to the form of disease to which he is alluding, sufficiently distinguishes the two kinds of cases; and indeed, after an examination of the cases recorded by Romberg, it will be found that they present very miscellaneous symptoms; and some of them seem rather to be cases of muscular atrophy than of true paralysis.

For instance, in the case quoted from Sir Charles Bell's works, the flexors of the left hand and fingers were much atrophied, while the extensors and supinators were normal; the supra-spinatus and infra-spinatus and the deltoid being atrophied in the last degree.

In the second case, reported from actual observation, a similar condition existed.

In the third case, the entire arm lost its former strength and usefulness. In a fourth case, a remarkable amount of atrophy of the muscles was found. Indeed there is only one case alluded to, and cited from Tanquerel, in which paralysis of the extensors of the hands and fingers simply was found, and this followed exposure to cold—"a distinct rheumatic exciting cause being demonstrated." This form of paralysis, a rheumatic paralysis of the nerves, has been clearly detailed by Duchenne; but in the cases recorded by me the disease could not be traced to such an exciting cause, and was found in the one fatal case examined to have a distinct spinal origin. The following case affords, I believe, another instance of this interesting form of paralysis. I am indebted to Dr. Barclay, under whose care the patient was admitted, for leave to publish the details of the case.

A man was admitted on the 16th of June with the following history and symptoms. He was a boiler-maker, 30 years of age, of rather intemperate habits, having been a free drinker of beer, and nine years before admission affected with chancre. With this exception his health

had always been good, and he had never suffered from rheumatism. Eleven weeks before admission he felt pain across the back, which he thought was due to rheumatism; this was followed by pain in the sole of the left foot; and there was some affection of the bladder, the urine not being expelled as usual. This latter symptom passed away, and six weeks before coming into the hospital he began to lose power in the left foot, and found that he could not walk properly.

When he came under observation, it was found that he could not extend the left foot; the power of flexion remained, though the extent of motion was diminished; the foot being only slightly extended after flexion, probably by the elasticity which remained in the extensor tendons and muscles. There was no paralysis, apparently, of any other muscles than the extensors of the left foot; there was complete power in the rest of the leg. On applying the test of faradisation to the leg in the usual manner, it was found that (with the brush) feeling was very much diminished in the leg on the outside of the tibia, and this loss of feeling extended to the upper and to the plantar surface of the foot; on applying the wet sponges, there was slight contraction of the muscles affected. There was decided wasting of the extensor muscles, the left leg being perceptibly and by measure less than the right, but there was no fibrillary action, as in cases of Cruveilhier's muscular atrophy. He stated that there was a little numbness of the right sole, and this certainly seemed to be true, but it was impossible to make out for certain that there was any loss of power in the right extensors; there seemed to be none. His mode of walking was peculiar; the action of the legs was perfectly natural, but the left foot fell and twisted inwards when he lifted it off the ground. It may be as well to say that there was not the slightest evidence of the presence of lead about the gums.

He remained in hospital for two months, and improved in condition; the power of extension was not improved on leaving, but there was decidedly improvement in sensation; more pain being caused by a weaker current; and the muscles gained in size.

The preliminary symptoms in this case support the opinion of the spinal origin of the disease.

The form of paralysis, when once seen, is very easily recognised; and I venture to think will not be found so rare as it would seem to be. The hands are dropped at the wrist, much in the same way as in lead-palsy, but the muscles are more lax. There is no contraction of the flexors, but the hands fall loosely and hang downwards, and can be made to alter their position by moving the forearm. The feet are in a similar condition. The soles are turned inwards and upwards. Frequently this condition is accompanied by an erythematous blushed condition of the skin, especially on those

parts exposed to friction. In some cases the degree of paralysis is so great that the patients are powerless to feed themselves in cases where the extensors of the hands are affected, and to walk where the feet are paralysed.

In hysterical conditions of this nature there is (always as far as my observation goes) a spasmodic contraction of the flexors; for instance, in hysterical paraplegia it is usual to find the toes pointed downwards as the patient lies in bed, the feet being strongly flexed on the legs; and a mere inspection of the limbs would be sufficient to distinguish the nature of the case.

It is not very common to find instances of general muscular paralysis from lead-poison; but a very interesting case was recently admitted into this Hospital with general atrophy and paralysis of the muscles. The man was a painter, and for ten years had suffered from dropped hands; subsequently the muscles of the legs became affected, and he was unable to walk. The most superficial observer would be able to detect a difference in the manner in which the limbs were affected in this case as compared with the cases that I have recorded. The general atrophy was very marked; the fingers were cramped, and scarcely any interosseous muscle remained; the feet were not turned upwards and inwards, the paralysis not being confined to the extensors; in addition to which distinctions, sensibility was not impaired.

Such are the clinical distinctions which seem to be sufficient for the recognition of these various forms of paralysis. But there are other forms of disease which may simulate paralysis of the extensors, though they may with proper attention be distinguished. The progressive muscular atrophy of Cruveilhier may be recognised by the more extensive wasting of the muscles, by the fibrillation which follows the irritation of the muscles affected, and by the absence of any altered sensibility of skin. But there is a form of muscular atrophy which is sometimes mistaken for, and is far more common than, true progressive muscular atrophy, which may simulate this form of paralysis rather more closely; I mean that form of muscular wasting which is associated with osteo-arthritis. Instances of this disease are not infrequent among tailors who have to use heavy weights; and I have seen cases where the

extensors have been affected. The history and the previous symptoms of osteo-arthritis will lead to the recognition of the nature of the case ; added to which, this form of disease yields readily to proper treatment.

More extended observations, and I would add especially confirmation from other sources, are necessary before the natural history of this peculiar form of paralysis can be considered complete ; but from those cases which I have seen, the sequence of symptoms seems to be remarkably uniform, and may be given in the following order :

The patient is seized with shiverings, pain in the back, and other symptoms which are the usual precursors of an attack of myelitis. A condition of hyperæsthesia may exist, which is commonly attributed to general rheumatic pains in the arms and legs ; this is followed by loss of power in the extensors, which is accompanied with altered sensibility ; either with hyperæsthesia so intense, it may be, that the patient screams when touched ; or there may be anæsthesia. The paralysis may affect either or both pairs of extremities. In the cases under notice the hands were first affected more frequently than the feet.

In the single fatal instance under observation death was ushered in by a series of convulsions, and the patient died comatose. In examining the spinal cord in these cases, the posterior columns, opposite the sixth cervical and twelfth dorsal, are the parts to which special attention should be directed. The microscopical examination made by Dr. Dickinson and myself showed conclusively that the disease, though affecting both sides of the cord, had clearly begun in one side ; thus satisfying any doubts as to the primary source of disease.

In conclusion, whatever value may be attached to these observations, my sincere thanks are due to the physicians of this Hospital for the very liberal manner in which they have placed their cases at my disposal, and to Dr. Dickinson for the care and trouble he has taken in the examination of the spinal cord on my account.

REGINALD E. THOMPSON, M.D.

VIII. ARE THERE SPECIAL TROPHIC NERVES?

It is as yet an unsettled point whether a special set of nerves exists presiding over the nutrition of the tissues apart from the musculo-motor and the sensory, and the vaso-motor. Samuel and Brown-Séquard maintain the affirmative. The former divides these trophic nerves into centrifugal and centripetal, and affirms that the former when excited increase nutrition, when paralysed decrease it. Their paralysis he regards as the cause of the diminished resisting power to injuries and irritations which is observed in anæsthetic parts. Brown-Séquard, speaking of reflex changes in nutrition, ascribes them to reflected irritation, either producing contraction of blood-vessels, and thus diminishing nutrition by inducing local anæmia; or acting through some nerves distributed to the tissues directly upon them, so as to effect an alteration of the interchanges between them and the blood.

Samuel supports his views (see *Canst. Jahresber.* vol. ii. 1861, pp. 53-57) by the results of experiments on animals, which showed that severe irritation of a compound nerve produced intense inflammation of the organ to which the nerve was distributed. Weber, on repeating these experiments, came to opposite conclusions. He believes that nerves, indeed, have a considerable influence upon the nutrition of the tissues, inasmuch as they can either increase or lessen the supply of blood and the metamorphosis of matter by the control they have over the muscular walls of the arteries, but beyond this their influence does not extend. It seems to me doubtful whether unexceptionable experiments to decide this point can be performed on animals; and in the mean time there are sundry results of injuries to nerve-trunks in man, which are well worth examining for the sake of their bearing on this question. Let us first recall to mind the results of paralysis

and excitement of the vasal, motor, and sensory nerves. Excitement of the *vasal*, whether effected by contact, galvanism, or malaria, causes contraction of arteries, anæmia of the parts they supply, and lowered temperature. It is very noteworthy that the arrest of an arterial current sometimes renders the part concerned quite pale, sometimes of a deep dull red. Cold very often has just the same effect on exposed parts, rendering them sometimes anæmic, sometimes much congested. In former days I have often seen my hands quite pale from exposure to cold; once I remember to the degree of causing alarm to an unphysiological physician. More commonly, however, we witness livid redness and chapping as the results. Observations on the frog's web show that with constricted arteries the capillaries may remain either empty or crowded with corpuscles. The cause of the difference in the two cases is not very apparent. I believe we must look to the tissues rather than to the vessels for explanation. It seems reasonable that the tissues should suffer in their nutrition if such conditions continue for any considerable time; and I think there is evidence that such is the case. A history, which I have quoted at p. 474 of my work on *Functional Nervous Disorders*, seems to me (embolism being excluded) to leave little doubt about the matter. It does not appear that the existence of a condition, where the supply of arterial blood is very scanty, and the engorged capillaries scarcely feed the semi-stagnant venous current at all, excludes the occurrence of inflammation. This may be regarded as proved by the observations of Weber and others, which have shown that inflammation could be produced in frogs' webs, which by strangulation or even by amputation were cut off from all dependence on the general circulation. Inflammation occurring under these circumstances is invariably of a low cachectic quality, and gives rise to ulcerations little disposed to heal—a circumstance which is probably dependent on the venosity of the blood in the capillaries. Chilblains are excellent samples of such inflammation; and it is evident that their successful treatment mainly depends on measures (such as friction) which procure free circulation of blood through the part. The possibility and probability of inflammation occurring in these states of comparative anæmia and certainly lowered vitality

is important to bear in mind, and we may have to refer to it subsequently.

The results of *paralysis* of the vasal nerves, as illustrated by experiments on healthy animals, are well known; but it is not generally admitted that inflammation is one of them. I am quite aware that it is rarely observed in animals which have been experimented on; but I think it is not uncommon in human beings who are sick, and whose status cannot be compared with that of a healthy animal. My grounds for the belief I entertain are these: 1. I have seen in a cat severe purulent ophthalmia of a few days' duration produced by division of the sympathetic nerve (blended as it is with the vagus) at the upper part of the neck. The temperature of the ear on the same side was 15° above that of the other. Bernard had previously made similar observations. 2. The inflammation of the intestines and cerebral membranes, which occurs in malarious fever of pernicious character, can hardly be ascribed to anything else than extreme local determination of blood, the result of paralysis of the sympathetic nerves, which is a recognised factor of the febrile paroxysm. 3. The occurrence of inflammatory disorganisation of the lung in cases of primary cancerous tumour at its root, which has involved and destroyed (as Dr. Budd believes) the pulmonary nerves. 4. The fact that a well-marked inflammation with sero-purulent effusion, such as a severe eczema or pemphigus, may be cured by arsenic discreetly administered, *i.e.* by a remedy which is certainly a nerve-tonic, while it is prone to become a tissue-irritant. 5. The occasional occurrence of intermittent or slightly remittent ophthalmias which yield to quinine in full doses, but are not attended with fever. It is impossible to explain the success of the remedy in these and like instances, unless we regard it as exerting a toning action on the vasal nerves which were previously paralysed. 6. The fact that severe neuralgia—a mode of palsy of sensory nerves, as I have tried to show—is sometimes attended with marked erysipelatoid inflammation of the parts affected. This seems fairly to be explained by assuming that in common neuralgia the sensory nerves alone are deranged, while in the case we are considering the vaso-motor are involved also.

Excitement of the voluntary motor nerves produces, we can

hardly doubt, increased flow of blood to the muscles, as it certainly does to the skin of the limb exercised. How is this brought about? Partly, it may be, that the acting muscles attract more blood to themselves; but chiefly, I think, by this: that the nervous energy being withdrawn from the vaso-motor nerves by the musculo-motor, the arteries which were previously contracted yield to the intravascular pressure and dilate. It is true that they do this in other parts of the frame besides those where the muscles are at work; but this only shows that the arterial dilatation does not depend on any mere local influence, and that there is more in the matter than only attraction to the muscles. Increase of temperature and of bulk in the muscles are well-ascertained results of excitement of voluntary nerves.

Paralysis of the same nerves, when the vasal remain unaffected, lowers the temperature of the part, diminishes its blood-supply, and, in consequence of this and the enforced rest, produces wasting of the muscles. The vaso-motor nerves acting unopposed keep the vessels contracted, and so the part becomes anæmic and cool, just as our feet do when we sit still for a long time.

Excitement of the sensory nerves produces commonly an active state of the motor, either by simple reflex action or by prompting the volitional centres. The vaso-motor nerves are liable to be similarly affected, as when plunging one hand into cold water is found to lower the temperature of the other, or when exposing the feet to cold and wet arrests the catamenial discharge. It is very noteworthy that in nerve-actions of this kind the most dissimilar agents may produce the same effects. Thus, while the application of ice to the surface will rapidly arrest hæmoptysis (Walshe) or uterine hæmorrhage, we find high authorities recommending means which appear the very reverse. Trousseau advises syringing the nasal cavities with water as hot as can be borne, as the most effectual styptic in obstinate epistaxis; and Dr. Druitt praises the same agent applied to the skin, as an effective means of arresting profuse localised sweating. Prolonged fatiguing excitement or irritation of sensory nerves, on the other hand, will paralyse vaso-motor. Thus, after much use of the microscope, the conjunctiva and adjacent skin may be notably congested; scybala

in the bowels may give rise to congestive retinitis, or to unilateral flushing and sweating of the head. In some observations I have made lately, I have found soaking the hand in tepid water (at about 90°) raise the temperature of the other hand very notably. The fact that pain and numbness and various dysæsthesiæ are so commonly experienced in sensory nerves, and that for a long period and with great severity, in some instances, without any apparent alteration of the cutaneous tissue in which they are implanted, must not be left out of view. It amounts to a proof, I think, that abolition or disorder of the function of sensory nerves does not *per se* avail much to derange the nutrition of the papillæ or of other parts of the skin.

I now proceed to examine some of the instances in which it seems most requisite to assume the existence of special trophic nerves, and to inquire how far the phenomena observed are capable of being accounted for on the grounds above stated. I take first Mr. Hutchinson's valuable paper on the results which follow injuries to nerve-trunks, in the *London Hospital Reports* for 1866. His opinion is doubtless correct, that the lesions of nutrition, which occur at a late period after the division of the ulnar nerve and artery, are not caused by the obliteration of the artery. Whether, however, they are not owing to "defects in blood-supply" seems to me much more questionable. The principal phenomena observed in these cases were—anæsthesia, lowering of temperature, lividity of the affected parts when they were cold changed to a dull brick-red when they were warm, and a marked tendency to inflammation, which, however, was not of long duration in any case. The lividity and the lowering of temperature must, I think, be correlated probably as the results of a common cause. They are well-marked phenomena in those quasi-hysterical cases noticed by Sir B. Brodie in his work on *Local Nervous Affections*, and also by Graves, where a limb in the morning is pale or purple and cold, as if there were scarcely any circulation of blood in it; while subsequently it becomes hot, with turgid vessels. We cannot account for such occurrences except by admitting the arteries to be contracted at one period, dilated at another. That such contraction of arteries will cause congestion of capillaries with dull red blood giving rise to lividity, we have already seen.

It can scarcely be doubted that arterial constriction depends as a rule on excitement of the associated vaso-motor nerves. But in the cases we are considering there is loss of nervous influence, paralysis. This is true of the sensory, but not, I conceive, of the vaso-motor, nerves. Owing to their simpler structure, they would be regenerated long before the more highly organised tubular could be, and would resume their control over the vessels. This seems *à priori* probable, and indeed it is almost a matter of certainty that such is the case; for were it otherwise,—were the vaso-motor nerves paralysed,—we should assuredly have, as Mr. Hutchinson has remarked, an opposite condition, viz. free blood-flow and elevated temperature.* But, then, what causes the excitement of the vaso-motor nerves? I believe the existence of a cicatrix of the skin and subjacent tissue may be referred to as an adequate cause. It is notorious how often a cicatrix, involving a nerve or some of its filaments, has given rise to the most severe and extensive nervous irritation; and I cannot think it improbable that a traumatic injury might have such an effect on the vaso-motor nerves without interfering much with the others, motor or sensory. But in several of Hutchinson's cases there were phenomena strongly indicative of diffused nerve-irritation,—as reflex pain in the opposite limb, contraction of the flexor muscles of the fingers, and loss of temperature to a considerable distance *above* the site of the nerve-lesion. These would not have existed had the condition been one of simple paralysis. The view I have taken seems to me confirmed by the fact that sensory nerves have often been divided by surgical operation without any such impairment of circulation and nutrition as results when the severance of the nerve is effected in a ruder manner by

* Waller's observations on the effects of refrigeration of the ulnar nerve are very noteworthy as to this point. He found that the first thermal effect of cold (ice) on the ulnar nerve was frequently a fall of temperature of 0°.5 Cent. at the inner fingers below that of the outer fingers. As, however, the nerve becomes paralysed, the temperature of the two inner fingers rises above that of the outer to the extent of 5° or 6° C. This is owing (he says) to the paralysis of the vascular nerves and vessels of the parts supplied by the ulnar nerve. The inner part of the hand during the period of complete paralysis presented symptoms of active congestion of blood, being red and very hot to the touch, and the pulse strong,—symptoms the more evident by comparison with the outer fingers of the same hand, where the temperature was so much lower and the pulse weak. *Proc. of Royal Soc.* No. 46, pp. 440, 441.

traumatic violence. Nay, ulcers previously existing have healed apparently in consequence of division of the main nerve of the affected limb.* Mr. Hilton's case, quoted by Mr. Paget (vol. i. p. 43), seems of special significance as to the effect of irritating pressure on a nerve; and its bearing has been well appreciated by Brown-Séquard (see *Phys. of Central Nerv. Syst.* p. 176). "The inconstancy of the results of injury of the spinal cord and nerves," which Mr. Paget alludes to when discussing the influence of the nervous force on the formative process, may be in great measure accounted for by remembering that it is not the destruction of motor and sensory fibres derived from the cerebro-spinal system which interferes with the due supply of blood, and consequently with nutrition, but irritation of those which are given off from the sympathetic centres. If the latter escape irritation, reflex or direct, nutrition may not be materially affected.

The occurrence of a peculiar kind of whitlow at the tips of the affected fingers in Mr. Hutchinson's cases is very noteworthy. There can be no doubt that all conditions which impair the vitality promote the occurrence of inflammation; and as the extremities of the fingers are a common seat of whitlow, it does not seem surprising that they were so affected here. We know how ready a dropsical limb is to inflame on slight provocation; and the circulation is about as much impaired in the cases we are considering as it is in many instances of cardiac dropsy. I doubt whether in a large number of cases the tips of the fingers would be found especially affected; they were not so in one of the subjoined cases

* There are two cases on record which prove, I think, that complete anæsthesia and motor-palsy from injuries to trunks of nerves *need* not be attended with any lowering of temperature. One is related by Mr. Hutchinson (*Med. Times and Gaz.* 1867, Jan. 19). The anæsthesia and paralysis have existed twenty years; but the fingers have never been inflamed, and when they have been accidentally burnt the sores have healed well. The temperature of the paralysed fingers is at present 1° hotter than those of the other hand. The other case is given by Dr. Syde (*Med. Times and Gaz.* 1863, March 21st), and very much resembles those related by Mr. Hutchinson. Six weeks after the injury, when the wound was healed, the hand was 4° to 6° colder than the other, of a leaden or bluish colour, its circulation extremely languid, and all motion and sensation was lost in the parts supplied by the median and ulnar nerves in the hand. Chilblains formed on the three inner fingers, and healed under galvanism. Soon after, the paralysis of motion and sensation continuing, the temperature of the injured hand had increased so much that there was scarcely any difference between the two sides.

from Sir B. Brodie, nor were they, as we shall see, in the next set of instances we have to consider. The following are excellent examples from an independent source of the degree in which circulation and nutrition are apt to suffer in these injuries. "A young man met with an accident in which the ulnar nerve was divided behind the inner condyle of the arm. The wound healed readily; but when I was consulted about three months afterwards, the little finger was cold and deprived of sensation, with purple spots upon it similar to those which precede the formation of vesications. A girl was admitted into the hospital after a similar accident. The little finger was cold and benumbed, and occasionally the whole of the integuments covering it assumed a dark purple colour. This was always followed by a broad vesication, then by a superficial sore, which, however, healed by the formation of a new cuticle; and this process was repeated several times while the girl remained in the hospital." In a case recorded by Mr. Simon of similar injury, the two inner fingers had become *swollen* and livid, with vascular injection. The very close resemblance between the above conditions and those of chilblains is unmistakable.

I am quite aware that in Earle's case (*Med.-Chir. Trans.* vol. vii. p. 182) the ulnar nerve was divided chirurgically, and a piece about an inch long excised. This, one would have expected, should have caused not only anæsthesia and paralysis (as it did), but increased blood-flow and heat, as in Waller's experiments. Instead of the latter, there ensued in a short time (four or five weeks) refrigeration and vesication, just as in Mr. Hutchinson's cases. Five years after the operation, the temperature of the anæsthetic part continued about 3° lower than that of the other side. Other similar cases may have been recorded. I cannot give any adequate explanation of them, but it may be remarked that we do not know in Earle's case what was the condition as to temperature immediately after the operation, not until about a month had elapsed. This period would be sufficient to allow the restoration of continuity of the nerve by new-formed nucleated fibroid tissue, especially as the symptoms imply the existence of neuritis before the operation, and the neurilemma of the nerve was found firmer and thicker than na-

tural. It is possible that in such a state the vaso-motor nerves in the distal part of the nerve might be kept permanently irritated. I should hardly offer this suggestion, did it not appear to me well-nigh certain that motor and sensory paralysis are *per se* incapable of producing refrigeration to any great extent, or impairment of circulation. It often happens, of course, that palsied limbs are colder than their fellows, just as unexercised limbs naturally are; but this is because the nervous force unconsumed in the musculo-motor and sensory department concentrates itself in the vaso-motor, which remains unaffected by the lesion to the cerebro-spinal centres. Brown-Séquard states that in anæsthetic parts the blood-vessels are usually contracted. A man æt. 36 is now in St. Mary's, who has been completely paraplegic for about a year, in consequence of angular curvature. Motor power is still very slight, and until lately was null. Sensory is a little better; he can tell which foot is touched, but not which toe. When at his worst, his legs and feet were totally anæsthetic, and were sometimes cold, at others warmer; the coldness would last one or two days, and the warmth about as long. At present the temperature of the right first cleft is 94° , of the left 97° . The frequent variations in temperature, the anæsthesia remaining the same, and the high temperature at the present time while the motor and sensory palsy are both still very considerable, afford, I think, strong ground for believing that the changes in temperature are not produced by the cerebro-spinal nerves, but by the vaso-motor which accompany them.

In the case of gunshot wound of nerves observed by the American surgeons, the principal phenomena were severe burning pain, perverted nutrition of the skin, the nails, the hair, and sweat-glands, as well as of some of the articulations, besides in many instances more or less paralysis of motion and sensation, with or without contraction of muscles. The latter phenomena call for no particular notice; only I may remark that in one case recorded (p. 126) as a typical example of pure tonic spasm without atrophy or palsy, the affected part was constantly cold; the vaso-motor nerves, it may be presumed, keeping the arteries contracted, just as the motor nerves did the muscles.

The *burning pain* seems to be evidently a neuralgia, and is so designated by the writers. It may come on almost immediately after the injury (p. 94), but as a rule occurs later, almost always during the healing of the wound. It may be of reflex origin; it has followed the transfer of pathological changes from a wounded nerve to unwounded nerves, and has then been felt in their distribution; so that it does not need a direct wound to give rise to it (p. 102). The part affected by burning pain is apt to become exquisitely hyperæsthetic, and in bad cases the entire body may be so also. Burning pain may or may not be attended with nutritional lesions of the skin or of its appendages, but the latter are almost invariably attended with this dysæsthesia. The temperature of the burning part is said at p. 104 to have been always found higher than that of surrounding parts, or of corresponding parts on the opposite side of the body. But at p. 135 we read, "It was observed that the member the nerves of which were affected was nearly always colder than the other, whether the nerve-lesion was extensive or trifling. In two cases there was no difference. . . . Five cases had a higher temperature in the wounded limb than in the sound member." Four of these were cases of burning pain. As burning pain is evidently of very frequent occurrence, we can hardly think that it was absent from all those instances (evidently the majority) in which the temperature of the injured limb was lowered. In case 31 (p. 149) it is mentioned that the left arm was *cold*, mottled, and swollen; the skin of the hand thin and dark-red; the whole arm and hand, except the back part, alive with burning pain. Tactility was nowhere absent, and localising sensation was good, except on the dorsum of the hand and fingers. The case was one of gunshot wound of the left brachial plexus. For the present we must leave the point as to the temperature of parts affected with burning pain unsettled. Repeated blistering of the seat of pain benefited this symptom more than anything else. Measures addressed to the nerve or the cicatrix were of no avail, though in other kinds of pain they were often beneficial. The observers are inclined to refer the pain to some altered state of the ultimate nerve-fibres connected with defective nutrition of the part. In one case where the

median and ulnar nerves had been injured, a portion of the former about two inches long was removed, the neurilemma of which was intensely red and injected (p. 112). It is remarkable that burning pain should have been so prominent a symptom in the American cases; I only find it mentioned in one of Mr. Hutchinson's.

The perverted nutrition of the skin appears in the change which suggests the epithet "glossy," and in the occurrence of eczema or ulceration. The affected skin in the glossy condition was deep-red, or mottled, or red and pale in patches; the epithelium appeared to have been partially lost, so that the cutis was exposed in places. The integument appeared contracted, less elastic than normal, often cracked. A vesicular eruption of eczematous or herpetic character was very commonly associated with this glossy state of skin, and gave some relief to the burning pain. In one case the eczema affected secondarily the hand of the uninjured limb. Glossy skin is generally attended with pain, mostly of the burning kind; but in some cases there is "no marked hyperæsthesia as to pain." It may be inferred "that the change in the skin arises from agencies which may or may not be associated with conditions which disturb the nerves of touch" (p. 83). At p. 104, however, it is said, "it appears quite certain that in cases of glossy skin burning always exists." Mr. Paget, who first particularly described this condition, also states his experience to be that it is in most cases attended with very distinct neuralgia in the fingers (which are most prone to be glossy), and in the whole arm. He also mentions (*Med. Trans. and Gaz.* 1864, March 26) having seen the same alteration in patients suffering from the neuralgia persisting after an attack of shingles on the arm. In one case of glossy skin which he records (of traumatic origin) the hands were insensible, or nearly so, but only occasionally in pain, and were very apt to become cold. *The hair falls off* and the *nails become much deformed* in cases where the nutritive disorder is of long duration. A rheumatoid affection of the joints, rendering them swollen and stiff and sore, occurs under the same circumstances, and is apt to be very persistent, even ending in ankylosis. Various *alterations of the perspiration*, rendering it offensive or sour-smelling,

have been met with in different instances ; sometimes it is suppressed in the paralysed part, which was perfectly dry.

To include all the above phenomena in a rational theory seems no easy matter ; but an attempt may be made. At the outset and for some time the pain, of more or less burning character, is probably dependent on change in the fibres of the nerve-trunk near the wound, and is therefore a referred sensation. At a later period, as evidenced by the success of blisters and the partial relief from local eruption, the terminal extremities of the sensory nerves are most affected. Still the probability is, that so long as the nutrition of the skin remains unimpaired the disorder is no more than a neurosis of the sensory nerves. That terrible infliction, epileptiform neuralgia, causing, as Trousseau describes it, *douleur atroce*, does not seem of itself to cause any nutritional lesion, though the patient in his agony presses his face with his hands till he permanently flattens it. In ordinary neuralgia, when severe, the affected part may become hot, swollen, red, and exquisitely tender from paralytic dilatation of the arteries ; but this condition is very different. That which is peculiar to the cases we are considering is a traumatic lesion of the nerve-trunks, which must almost necessarily give rise to more or less of cicatrix in healing, and thus determine irritation of the nerve-fibres. The statement made at p. 79 is particularly important : " That the changes in nutrition do not belong to cases of complete destruction of the nerves. They occur in such as have received slight or severe nerve-wounds, provided always that these latter do not separate the part entirely from its nerve-centres. They may begin within a few days, or at any later date, but usually they arise while the wound is healing, and are in many instances distinctly related to the occurrence of inflammatory accidents in or about the wound." If for these and other reasons it be admitted that the irritation of the cicatrix or of the wound keeps the vaso-motor nerves in a state of constant excitement, the parts under their influence would have a lowered temperature and contracted arteries, under which circumstances, as we see in chilled hands and feet, the capillaries are apt to be filled with stagnant blood. If the circulation be thus materially interfered with nutrition cannot go on normally, the epidermic cells and hair and nails

cannot be formed, the synovial fluid cannot be properly secreted, nor the perspiration either. As long as things remain in this state the temperature will be lowered, just as it was in Mr. Hutchinson's cases; but if inflammation set in, as it is very prone to do in parts which are deprived of sensation, the temperature will be more or less elevated. It is most probable that the course of events is not identical in all cases of traumatic nerve-lesion. After nutritional lesions have ensued in remote parts, as the hand, more or less alteration may take place in the pathological condition, the sensory disorder may be modified, and the vaso-motor spasm replaced by paralysis. This may occur earlier in some cases than in others. In one of Mr. Paget's it occurred at the end of five weeks. Here there was at first almost complete motor and sensory paralysis; subsequently the numbness was replaced by pain, and the skin of the fingers became hot and red and glistening.

I may here refer to three cases recorded in my work on *Functional Nervous Disorders*, p. 473, in which the phenomena bear a good deal of resemblance to those we have been examining, although there was no traumatic lesion. Burning pain existed in two; in all the earlier symptoms were those of defective circulation and dying of the tissues; the epidermis alone was actually lost in the two first; but in the third, the extremity of the right little-finger mortified, and was removed. It is worth remarking, that in Dr. Fuller's case of spontaneous gangrene from arterial obstruction the pain in the affected limbs was of a burning and pricking character. I do not see how to account for the occurrence of offensive or acid sweats in the gunshot-wound cases on the above view; but it is mentioned, in one of my cases above cited, that a foetid sweat was observed during electrification of the parts.

Mr. Carter's admirable investigations into the pathology of leprosy in India have an important bearing on the subject before us. He has clearly ascertained, in numerous instances, that certain changes in the hands and feet were connected causatively with disease of the nerve or nerves supplying the affected parts. He instances alterations taking place at the inner side of the palm and dorsum and two inner fingers of the hand, with evident enlargement or tenderness of the ulnar nerve at the elbow, and no other local symptom what-

ever. First, the benumbed skin shows evidences of atrophy, shrivelling or wrinkling, dryness; sometimes desquamation of the cuticle; a reddish or purplish hue, and a decided diminution of the temperature; the whole giving the impression of a dry wasting or mummifying process, with sometimes the idea of a subjacent effusion of reddened serum. In the early stages bullæ may appear on the sides or tip of the fingers, filled with dark-coloured serum; the concentric lines on the cuticle disappear, owing doubtless to the absorption of the subjacent rows of papillæ, and a finely-wrinkled but especially smooth surface is left; the sweat-glands becoming affected cease to act; the interosseous muscles waste; and the bones are gradually removed by absorption. The changes in the nerves whose distribution corresponds to the affected district consist in the development of a clear nucleated tissue among and between their tubules, which eventually become quite destroyed; the nerve-trunks are enlarged, of reddish-gray colour, firm though supple, and usually present no evidence of inflammation. Now it is needless to point out how much correspondence there is between the nutritional alterations in these cases and in those studied by the American surgeons. The phenomena are essentially indicative of starvation of the tissues from defective supply of blood. If we take the view that they are dependent on the anæsthesia, we are met by the fact that nothing of the kind need appear when the nerves of a limb have been simply divided. On the other hand, the view which I have proposed as the irritating effect of a cicatrix on the vaso-motor nerves does seem to receive confirmation from the morbid anatomy of anæsthetic leprosy. The new-formed fibroid tissue (itself not very dissimilar in structure to the sympathetic fibres) which destroys the cerebro-spinal tubules may not affect the vaso-motor so injuriously; and, at any rate, the effects produced are very much what irritation of the latter would give rise to.

The phenomena observed in paralysis of the fifth nerve are especially noteworthy, because the skin of the face is so highly organised, so copiously supplied with blood and with sensory and vaso-motor nerves. I shall subjoin some brief abstracts of recorded cases. Mr. Bishop states that a lady had been affected with total insensibility of the left side of

the face and head, together with strabismus, accompanied with double vision, but the power of voluntary motion of all these parts remained entire. The globe of the left eye was quite insensible to the touch, though it retained the power of vision unimpaired, except that for some time previous to death it had lost the faculty of distinguishing colour. The left nostril received no impressions from the most irritating stimulants, such as snuff and ammonia, yet the sense of smelling continued unimpaired. The left side of the tongue was quite insensible to impressions both of touch and taste. No mention of any nutritional lesions. On examining the brain after death a scirrhus tumour was found lying on the inner surface of the sphenoid bone, extending laterally to the internal auditory foramen, and resting posteriorly on the pons Varolii, which was slightly ulcerated. The tumour had completely obliterated the foramina for the exit of the three branches of the fifth pair of nerves (*Lond. Med. Gaz.* 1833, Dec. 21, p. 464).

Sir C. Bell* reports the case of Mrs. F., who, $2\frac{1}{2}$ years before her death, suffered from a burning sensation at the left side of the tongue, which extended over half the mouth, face, and head, and was accompanied by an almost total loss of sense of touch in the parts affected, and by a sensation like the pricking of ten thousand needles. The left nostril was devoid of sensation, and a feather passed three inches into it caused no sneezing. The affected side of her face was subject to become swollen, red, livid, and extremely hot. Some months before death the hearing of the left ear was lost, and the left facial nerve was paralysed. At the autopsy a tumour of the size of a pigeon's egg was found considerably indenting the left side of the pons, and compressing and atrophying the fifth and seventh nerves on that side.

The same author relates the following history :

J. W., æt. 40 (?). The whole left side of face was deprived of sensation, and the masticatory muscles on the same side were wasted and flaccid. Vision remained, but the pupil was dilated and the globe-muscles were powerless. He continued in this condition many months, and notwithstanding the loss of sensation and motion in his eye, that organ preserved its natural transparency. Afterwards, the facial muscles on the left side became paralysed; and soon after violent conjunctivitis

* *On the Nervous System*, 3d edit.

came on, and a thick deposit of granulations covered the whole surface, totally destroying vision. The left nostril was utterly insensitive, and got obstructed with a substance resembling glue tinged with blood—which was brought away by a piece of stick. The left side of the tongue was numb with burning pain. At the autopsy a tumour was found occupying the whole of the cavernous sinus, and imbedding in its substance the third, fourth, fifth, and sixth nerves.

In the first case recorded by Mr. Dixon* there was complete anæsthesia of all the left half of the face; wasting of the masticatory muscles; the eye, nostril, and tongue were deprived of sensation; subsequently, amaurosis occurred, and palsy of the third nerve. The anæsthesia had existed for sixteen months, and yet there was not the slightest inflammation of the eye, nor any opacity of its humours. Mr. Dixon remarks, “that the pressure which interfered with the functions of the nerve was applied near its root, or at the Gasserian ganglion, was evident from the fact of the motor portion being equally affected with the sensitive.”

In Mr. Dixon's second case there was total anæsthesia in all the range of the left fifth nerve, including the eyeball, the nostril, and the tongue; and the masticatory muscles were paralysed. The lacrymal secretion ceased. The patient, a female æt. 59, was weakly, and had some remarkably dry ulcerations at the inner canthus of the left eye and ala nasi. The latter healed quickly under liquor arsenicalis. Eight months after the anæsthesia commenced the eye was attacked with inflammation, the cornea became opaque, lymph was effused into the pupil and anterior chamber, and the organ was probably destroyed. The inflammation seems to have been of a languid, chronic character, attended with livid redness and complete arrest of secretion. The disorder came on about a fortnight after the left canine tooth had been extracted on account of toothache. Subsequently the cornea regained its transparency, but the anæsthesia, after some temporary diminution, again became total, the left ear became quite deaf, the left sixth nerve and one branch of the third paralysed, and the patient had frequent attacks of giddiness and loss of memory. These circumstances leave no doubt that some intra-cranial mischief existed, probably close to the origin of the fifth nerve.

* *Med.-Chir. Trans.* vol. xxviii.

In a case related by Sir Thos. Watson in his Lectures (vol. i. p. 533), there was complete anæsthesia of the right half of the face, as well as of the eye, nasal and buccal mucous membranes on that side. The motor portion of the fifth was paralysed as well as the sensory. Recovery took place under the use of local bloodletting and counter-irritation. No nutritional lesions are mentioned. A similar case where the nutrition was unimpaired, though there was complete anæsthesia, and the Gasserian ganglion and its nerves were destroyed, is recorded in *Med. Times and Gaz.*, April 25, 1868.

Romberg lays down the proposition that “when the entire sensory tract of the fifth nerve has lost its sensation, and there are at the same time derangements of the nutritive functions in the affected parts, the Gasserian ganglion, or the nerve in its immediate vicinity, is the seat of the disease.” The eye inflames, suppurates, ulcerates, and becomes atrophied; the mucous membranes of the nose and mouth are reddened, and there is hæmorrhage; the gums become scorbutic and inflamed (vol. i. p. 215). One case which he cites under this head, though there was no dissection, was the result of a fall on the left side of the head, which probably caused extravasation of blood, or some laceration near the left side of the pons Varolii. After about five months the conjunctiva of the left eye became of a dark dusky-red, œdematous, and covered with a thin secretion which fretted the swollen edges of the lids; the lower half of the cornea was rendered opaque by interstitial exudation; there was considerable mydriasis, and capsulo-lenticular cataract; the functions of the retina were much impaired, and the bulb felt very soft. The patient complained especially of the difference in the complexion of the two sides of his face, the left being remarkably pale and flabby. The slightest touch caused the mucous membranes of the nostril and mouth on the left side to bleed. The entire left side of the face was insensible in the whole range of the trigeminus; the eye, nostril, and tongue could be irritated in every possible manner without producing the slightest impression. There was superficial ulceration of the left concha produced by the fez cap which is worn over the ears.

Romberg's proposition hardly seems to be borne out by

the above-cited cases. In Mr. Dixon's first patient, in Mr. Bishop's, and in one of Sir C. Bell's, the tumour occupied a situation so near to the Gasserian ganglion that nutritional changes ought to have occurred. The same may be said of Sir C. Bell's second case, for the eye was not attacked by inflammation until the orbicularis palpebrarum became paralysed. From these and other histories which might be cited, it seems fairly deducible that anæsthesia of the face from destructive disease of the fifth pair may continue a very long time without causing any nutritional changes, and that its influence therefore *per se* cannot be rated highly. This corroborates previous statements. In the first of Sir C. Bell's cases there is distinct evidence of the occasional occurrence of vaso-motor paralysis, marked by swelling, redness, and great heat of surface; and it is rather remarkable that this is the only instance in which it seems to have occurred. In the case cited from Romberg the pallor of the affected skin, the dark dusky-red of the conjunctiva, and the wasting of the bulb, render it probable that the vessels were contracted, and the vaso-motor nerves in a state of irritation. The complete arrest of lachrymal secretion in Mr. Dixon's second case is very interesting, corresponding as it does with some of the American observations. It affords, I think, a further argument for the view that the inflammation in this case, as in Romberg's, was of the chilblain character, the hyperæmia depending more on venous reflux than on arterial afflux. It deserves to be noticed that the nutritional alterations are almost entirely confined to the mucous membranes of the eye, nose, and mouth; the skin is but rarely affected. It is difficult not to refer this difference to the much greater tenuity and delicacy of the protective cell-covering in the two cases, and to think that the irritating action of particles of dust, or the like, is concerned in the result. Probably, as long as the vaso-motor nerves remain unaffected and the circulation goes on properly, the impairment of nutrition caused by the anæsthesia is too slight to cause textural derangement. But if the vaso-motor nerves are either paralysed or irritated, and the amount of blood-flow rendered excessive or scanty, then nutritional lesions will readily be produced in the pre-disposed parts.

The results which ensue when an aneurism or a malignant tumour presses upon and destroys the pulmonary nerves of one lung call for some notice here. Cases have been published by Drs. Budd,* Gull,† and Habershon,‡ proving that destruction of these nerves is very apt to be attended with a low form of pneumonia, producing hepatisation or even sloughing to a very considerable extent. The nerves which suffer in these cases are chiefly the vaso-motor, derived from the sympathetic ganglia, or filaments of the pneumo-gastric, which probably fulfil the same office. Paralysis of these nerves must have the same effect as it has in other parts; but it seems probable that the resulting hyperœmia and inflammation is more apt to assume a destructive form because the blood which is sent to the inflamed part is originally venous, and must remain so in consequence of the aerating tissue being speedily rendered unfit for its function. It does not seem to me that there is anything in these phenomena which necessitates the assumption of the existence of a special class of trophic nerves. The grave lesions which occur can be reasonably accounted for on the grounds which have been just stated, viz. inflammation originated by vaso-motor paralysis and venosity of the blood. Comparing these instances with some of facial anæsthesia from destruction of the fifth nerve near its origin, it cannot but be noticed how much more constant and severe the lesions are in the former than in the latter. This is attributable to the affected nerves being in one case chiefly sensory or motor, in the other chiefly vaso-motor.

There are other instances of nutritional lesions in connection with nerve-disorder which occur under different circumstances, and to which the foregoing hypothetical explanation will not apply. It is true that Brown-Séquard regards (if I understand him right) the sloughing sores which occur on the nates and elsewhere in cases of paraplegia from fractured spine, as results of persistent contraction in the blood-vessels of the part, in consequence of the pressure on the cord produced by the displaced vertebræ; and Dr. Gordon's case of

* *Med.-Chir. Trans.* vol. xlii. p. 228.

† *Guy's Hosp. Rep.* 1859, p. 308.

‡ *Proc. of Med.-Chir. Soc.* vol. iv. p. 281.

trephining the spine (*Med.-Chir. Trans.* vol. xlix. p. 21) supports his views. But in the bed-sores of low fever there is little ground for thinking that the arteries of the sloughing part are contracted; and the same holds true, I suspect, of a good many cases of paraplegia attended with decubitus. One report from my note-book mentions the legs of a paraplegic being fully warm to the hand at the time when a bed-sore was forming on the right hip. Another from the *London Hospital Reports*, vol. i. p. 193, states that the temperature of the patient's feet was much increased, the thermometer marking 89° ; nevertheless deep sores formed on both outer ankles; the patient was quite deprived of motion and sensation in the lower limbs. A case is recorded at some length by Romberg, in which it is mentioned that the temperature of the paralysed foot was higher than that of the healthy, and yet the skin was ulcerated in two places. The anæsthesia in this case was the result of the removal of a neuromatous tumour attached to the sciatic nerve; the nails exfoliated, and the epidermis constantly desquamated. These cases—and many others might no doubt be cited—are sufficient to show that ulcers may form in parts where there is no reason to think that the arteries are constricted, but quite the reverse. Moreover, in some instances where there is marked coldness of the paralysed limbs sores do not form.

The redness which is the precursor of a bed-sore is very much the same as may be seen on the forehead of a healthy man who has worn too tight a hat for several hours. It is, I believe, an indication of the tissue of the skin having suffered irritation, or, more precisely, having undergone such derangement of its nutrition, that it attracts more blood to itself, and retains it longer than would normally be the case. There is hyperæmia, but it is hyperæmia with stagnation, in consequence probably of weakened *vis a tergo* at the heart.

In the great majority of cases of decubitus the heart's action is very feeble, though it may be rapid; and there can be no doubt that the blood-current it sends must make its way with great difficulty in parts which are much exposed to pressure. The hyperæmia which is so evident is probably more venous than arterial, though as the epidermis becomes thinned the colour may become brighter; and it cannot be surprising

that, under these circumstances, nutrition should languish, and the part die. Defective circulation produced in this way, and not by arterial constriction, has no doubt very much to do with the occurrence of most bed-sores in the paraplegic. At the same time I think it must be admitted that defective innervation, apart from altered states of blood-flow, is a factor of more or less importance. Much, no doubt, depends on the idiosyncrasy of the individual, or the quality of his tissues. Some pass through a severe low fever without any tendency to bed-sores; in others they can hardly be avoided by any pains. The skin must evidently be endowed with a stronger vitality in the former than in the latter. When, however, the vital power of the skin is weakened in any way by low fever-poison, by hectic, or by loss of innervation, it becomes prone to ulcerate from causes which otherwise would not affect it. We can better understand this occurrence in states of general poisoning of blood and tissues, or in general exhaustion, than we can in mere paralysis. Yet, as there is no doubt that the sensory nerves do constitute an important part of the skin, it does not seem extraordinary that their death (or what is well-nigh equivalent to it) should more or less interfere with the vitality of the cells and fibres. An unused muscle deprived of motor influence wastes away and degenerates fattily, although its blood-supply remains unchanged. May not wasting change of the same kind occur under like circumstances in the sensory organs? This seems to be Mr. Hutchinson's opinion, who regards the loss of *vis a fronte* as accounting for the low temperature and the enfeebled circulation, as well as the lesions of nutrition. I accept his view as regards the latter in those instances where the temperature is not lowered, but where there is considerable refrigeration, I believe irritation of vaso-motor nerves to be the dominant condition.

In conclusion, I may say that my review of the subject leads me to discredit very much the doctrine that there exists a special class of trophic nerves; inasmuch as all the phenomena, to explain which their existence might be invoked, seem to be fairly explicable by alterations in the condition of those which have been long familiar to us.

IX. ON IMPROVED METHODS OF INDUCING AND ACCELERATING LABOUR,

WITH THE VIEW OF OBTAINING INCREASED SAFETY TO
MOTHER AND CHILD.

For some years past it has appeared to me that the proceedings for effecting premature delivery, in cases where the continuance of pregnancy to term was perilous to mother or child, required revision. It is true that we possessed several means of provoking the uterus to premature action, and to expel its contents. But the practice followed was in general limited to the use of one or other of these provocative agents; the rest was abandoned very much to accident. The time spent in anxious suspense by the expectant mother; the moment when the labour would be so far advanced as to admit of or require the attendance of the medical practitioner; and the result to the child, were matters of chance. Thus, supposing it was determined to bring on labour at the eighth month by detaching the membranes, by puncturing them, or by inserting a bougie in the uterus: this done, it has been considered that the next thing to do was to wait patiently until active labour should set in, when the medical attendant should be sent for. And what commonly happens is this: labour may set in possibly in twelve hours, in twenty-four hours, perhaps on the second or third day, or even later. There is no certainty about it. And when it comes, the child is expelled without warning, almost suddenly, and before the medical attendant can be fetched. Or another serious mishap may arise. In premature labours, owing to want of proportion between the size of the child and the pelvis, and the frequent excess of liquor amnii, when the child comes to present, it assumes an unfavourable position, or the cord falls through. In either case the safety of the child depends upon the instant aid of the medical practi-

tioner; and he is likely to be out of the way; for who can sit at a bedside for an indefinite period ranging from twelve hours to three or four days or more?

Does it not follow that it is desirable to keep a control over the whole course of the labour? to take care that nothing adverse to mother or child shall happen in our absence? to substitute, in fact, skill and foresight for accident? Few, perhaps, will hesitate to answer this question in the affirmative. But another question must follow: Can we so regulate a provoked labour throughout as to limit and define the time expended, and to conduct the delivery so as to give more security to the child and to the mother?

This question will, I think, be satisfactorily answered by the histories of the cases which follow. Assuming, then, that it is both desirable and possible to control and to regulate the entire course of a labour prematurely induced, I will describe the method after which the proceeding should be conducted. It is convenient to divide the act of artificial labour into two stages. *The first stage is provocative and preparatory*; this includes some amount of dilatation of the cervix uteri, and implies a certain amount of uterine action, and lubrication of the cervix and vagina. *The second stage is the accelerative or concluding stage*; it consists in the expulsion or extraction of the fœtus and placenta.

The ordinary modes of conducting an induced labour almost ignore the last stage, or the means of accelerating delivery.

1. *The provocative and preparatory stage.*—The means of preparing the uterus for the task prematurely thrown upon it are numerous. I will not discuss their relative merits in detail, as I have done this in a memoir on “The Induction of Premature Labour,” in the *Obstetrical Transactions*, 1862; but I think it important to repeat an emphatic warning against one of them. I mean, the plan of injecting water or other fluid into the uterus. This was introduced by Schweighäuser and Cohen; and is sometimes described as Kiwisch’s plan. But Kiwisch’s plan is simply to inject water into the vagina, playing the stream against the os uteri, not into the cavity of the uterus. Now Kiwisch’s plan is generally harmless, but it is certainly often useless. On the other hand,

Cohen's intra-uterine injection, although far more certain in its action, is fraught with extreme danger. *Both in this country and abroad several cases of severe shock and of sudden death have been caused by it.* Of course no advantages or convenience, however great, can counterbalance such a danger. The plan, therefore, ought to be rigorously discarded. There are means that are perfectly safe and effective.

It is important to recognise, *in limine*, the essential difference between provoked premature labour and labour at term. *In the premature case, labour finds the uterus in an imperfect state of development.* This condition involves imperfection in the contractile power of the body of the uterus, and greater resistance in the cervix. These things must be taken into account. They call for artificial aid. The uterus is called upon suddenly, and before its time, to do that for which it is not prepared. It is but reasonable to anticipate that help will often be useful. And help can be given to facilitate the dilatation of the cervix, and to supplement the contractile energy, if this cannot be aroused. The course I adopt is as follows: Having determined as closely as possible the period of gestation, I fix the day for the operation. On the evening of that day, the patient being in bed, I pass a No. 8 or 9 elastic bougie into the uterus, as far as it will easily slip in; it will generally go in to the extent of four to six inches. The end projecting beyond the os is then twisted up into the vagina; this keeps the bougie *in situ*. The patient keeps her bed for the night, so as not to disturb the bougie. Next morning, it will almost always be found that some degree of preparatory action has been effected. The cervix will be softer, and perhaps admit the finger; the vagina will be well lubricated with mucus; and some uterine contraction or pains will be present. If this should merge into active labour, the bougie may be withdrawn; otherwise it may be left or replaced. Towards the afternoon, the cervix will be more yielding and expanded. The further course must then be determined by the special indications of the case. If the pelvis be normal, and the labour have been induced on account of constitutional disease, it is generally better not to resort to any active accelerative measures, but to let the labour take its own course. When the cervix will

admit two or three fingers, if active pains are not present, it will, however, be desirable to tap the membranes by making a small scratch with a stilet or a quill. The drawing-off of a little liquor amnii, allowing the uterus to collapse, commonly stimulates it to increased activity, and in a few hours the child may be expelled. It is, of course, necessary to watch, lest the position of the child should become unfavourable, or the cord become prolapsed; circumstances, I repeat, very likely to occur in premature labour.

If the labour have been provoked on account of pelvic distortion, greater assistance will be required. The first difficulty to overcome is the resistance of the cervix uteri. The great agent in dilating this structure is *the direct pressure upon and within it* of the foetus and membranes distended by liquor amnii. But when the brim is contracted, this pressure can rarely be exerted effectually. Hence the tediousness and danger attending the *laissez-faire* or expectant treatment. The child may perish from long compression; the mother may be exhausted by protracted pain and shock. To avoid these dangers, it is now necessary to dilate the cervix by means that imitate as nearly as possible the natural agency. Introduce the caoutchouc water-dilator into the cervix, taking care that the narrow middle part of the bag be gripped in the ring of the cervix; then distending it gently and slowly with tepid water, the finger on the cervix takes note of its effect. In half-an-hour or an hour, the middle-sized bag will commonly have increased the dilatation so that the cervix will admit three or four fingers. This is the time to rupture the membranes. If the uterus act with sufficient power, and the pelvic contraction be not so great as to impede the passage of the child's head, watch, and let Nature do her work. But if the head is delayed at the brim, the physician must intervene. He has two alternatives. He may first try the forceps. If the distortion is moderate, the conjugate diameter measuring say 3.50", the head may come through. But if it do not come easily, and especially if the conjugate is reduced to 3.00" or below, turning is the true accelerative means. If I may trust my experience, I should, without hesitation, say the prospect of a child being born alive under the conditions postulated is much better than

under any other mode of delivery, and even better than is the prospect under turning in ordinary circumstances at the full period of gestation. The explanation is as follows: the child's head is not only smaller, but it is more easily moulded; it is caught at the smaller or bi-temporal diameter, between the projecting promontory and the symphysis pubis; the jutting promontory leaves abundant room on either side in the sacro-iliac region of the brim for the cord to lie protected from pressure; and if care be taken that the cervix uteri be adequately expanded, the head comes through so quickly that the danger of asphyxia is not great. The mode of turning demands consideration. The object being to secure a quick delivery, the soft passages must be well prepared. We might turn by the bi-polar method without passing more than two fingers through the os uteri. But I have found that, although it is always well to avail ourselves more or less of the bi-polar principle to facilitate turning, it is desirable in this case to pass the greater part of the hand through the cervix to grasp the further knee. The reason is this: the cervix that will admit the hand will in all probability admit the ready transit of the child. We thus secure adequate dilatation.

When the turning is completed, extraction must follow. It should be performed gently, drawing upon the one leg until the breech has passed the outlet: the extraction of the trunk should be slow, and a loop of cord should be drawn down to take off tension. When the arms are liberated, the neck of the child is in danger of being constricted in the circle of the cervix. This is the moment for acceleration. The two legs are held at the ankles by the left hand, whilst the right-hand fingers are crutched over the back of the neck. The head is sure to enter the contracted brim in the transverse diameter; it then has to describe the circle round the point of the jutting promontory which I have described ("Lectures on Obstetric Operations," *Med. Times and Gazette*, 1868) as "the curve of the false promontory." Traction must therefore, at first, be carefully exerted in the direction of this curve or orbit; that is, well backwards, so as to bring the head round and *under* the promontory. When it has cleared the strait, and is in the pelvis, the occiput commonly comes forward, and traction is changed to the direc-

tion of Carus' curve, to carry the head through the outlet. Unless rigorous attention be paid to the above rule for bringing the head through the brim, so much time may be lost as to imperil the success of the operation.

Turning, as a mode of delivery in contracted pelvis, is not, I believe, yet established as an orthodox proceeding. Certainly, to be successful, it requires precision in diagnosis and skill in execution. But these are requisite conditions in all surgical operations. I have now, with tolerably mature experience of the operation in all its applications, no hesitation in expressing my opinion that turning in contracted pelvis, where labour is induced prematurely, is an operation of the highest value as a means of extricating the mother from peril, and of saving the child. It has this great advantage: it enables us to postpone the induction of labour for two or three weeks or more, so as to reach a stage of greater development of the child. If, for example, we preclude ourselves from turning, and the pelvic contraction leave only 3·00'' or less of conjugate diameter, we must bring on labour at the end of seven months, or spontaneous delivery may be defeated, and with this the child is lost; whereas, if we contemplate turning, the gestation may be allowed to go on till the end of eight months; for a living child may easily be drawn through a conjugate of 3·00''. A further advantage obtained by this postponement consists in the greater probability of having to deal with a viable child. If we calculate too closely, say from the first week after the last menstruation, and fix the induction of labour 220 days from that time, we may find that the child has really not attained a stage of development corresponding to our calculation. One design of the proceeding is thus frustrated by error of estimation. But if, on the other hand, we feel confidence in putting off the labour until the 250th day, we cover this range of liability to error, and secure a child that is at any rate viable.

The histories which follow illustrate, and I think prove, the value of the principles laid down.*

* Other cases are narrated in a memoir "On the New Method of Inducing Labour at a predetermined Hour," published by me in the *Edinburgh Medical Journal*, July 1862.

Case I. illustrates the course of proceeding when the pelvis and soft parts are normal, and the labour is induced in the hope of saving the child by anticipating the probable period of its death in utero. In similar cases it is commonly sufficient to limit action to provocative means.

CASE I.—In March 1867, Mr. Brown of Finsbury-circus consulted me in the case of Mrs. M. She had had several dead children. There was evidence of constitutional syphilis. She took chlorate of potash; but as there was too little time left for the action of medicines, the death of the child in utero being probable, we agreed to induce labour at seven and a half months. On the 30th March, at 6 P.M., I passed an elastic bougie six inches through the os uteri. In the night some pains set in. Next morning, the vagina was well lubricated, and the os a little open. This was the state of things at 1 P.M. I then had to attend an urgent consultation in the country, and left the case in the hands of Mr. Brown. Labour became more active in the evening; the membranes became tense at 9, then broke, and a living child was delivered without assistance at 9.40 P.M.

Mother and child were doing well some time afterwards.

Case II. was similar in its indications to Case I. Although the child was born alive, it was scarcely viable. But for the fear that it would die in utero, it would have been desirable to postpone the labour.

CASE II.—In July 1866 Mrs. B. consulted me with the following history. She had had four children. All had died about the eighth month of gestation, and labour set in exactly fourteen days after the death of the child. She is now five months gone. She has laryngeal hoarseness, tonsils large, denies having had any rash, fair *embonpoint*, good complexion, general health good; but there is slight harshness of respiration in both lungs, with dulness in left apex, and a slight clicking mucous crepitation. Her voice got well at the seaside, but the hoarseness came back on returning to London (Dalston). She took chlorate of potash and iodide of potassium. It was calculated that her time would expire at the end of November. It was arranged to bring on labour at the end of October, or earlier, if occasion seemed to indicate. At the beginning of October she was overtaken by the sensations which on every previous occasion had marked the impending death of the child. It was therefore determined to act at once.

On the 4th October a No. 8 bougie was placed in the uterus, and left for five or six hours. On the 5th, at 2 P.M., there was some mucous secretion, but no uterine action. As I had two other cases of the same kind in hand, I did not proceed to dilate, but replaced the bougie. On the 6th, at 2.30 P.M., I went to complete. The os admitted two fingers. I dilated by medium-bag to a diameter of two inches, and punctured the membranes. The head was presenting. I then used the large di-

lator. The head became displaced, and the hand was felt. At 5.30 p.m. the dilatation was sufficient to admit of turning. I passed my hand through the cervix as a security that there should be sufficient room for the head to follow easily. I turned and extracted the trunk quickly; a large coil of cord came down. The head was a little delayed in the cervix, but the child (boy) was born alive. It was feeble, of immature development, of barely seven months. It cried and gave hope of surviving, but in an hour and a half it became convulsed and died. The placenta showed no calcareous deposits, but was paler than natural and lacerable. Mother did well.

Case III., although not entirely successful, is a good example of the value of turning where there is deficient uterine action, even when the pelvis is normal. The history of the case renders it probable that there is permanent damage to the kidneys, apt to culminate in aggravated albuminuria, and of convulsions whenever pregnancy takes place.

CASE III.—Mrs. Z., 4th Nov. 1865, æt. about 38, has had several children. Recommended to my care by Dr. Sutro. Four years ago had convulsions, and was delivered in a state of unconsciousness by the late Dr. Waller. Has had two children since; is now about three months, or less, pregnant. Hæmorrhage appeared yesterday, and became more profuse in the night; had repeated fits of syncope, when pulse could not be felt. She is very stout, so that it is difficult to command the uterus between the two hands. I, however, passed one finger into the uterus, and cleared out some shreds of membrane and clots. I then injected perchloride of iron; there was no hæmorrhage afterwards. She was very prostrate; took brandy and opium; she vomited several times. In a few hours she had rallied somewhat. I passed my hand into the vagina with some difficulty, owing to the corrugation caused by the iron. The finger penetrated to the fundus uteri; the uterus was contracted; nothing in it. There was no fresh hæmorrhage. She recovered favourably.

On the 18th September 1866, I was requested by Dr. Sutro to see Mrs. Z. again. She was expecting labour at the end of October. Fourteen days ago she had a convulsive fit. There was copious albumen in the urine, and œdema of the legs. A second fit occurred three days ago, and a third this morning at 3. I found her stertorous and restless. The os admitted the finger, but there was no uterine action. I ruptured the membranes; a very copious flow of liquor amnii ensued. I then dilated the cervix by means of my bags. In two hours the cervix admitted the hand. A clot of blood came. The placenta was in the cervical zone. I turned and delivered. The cord felt during search for foot was quite pulseless. Child (girl) nearly full-grown. A very large clot, weighing probably 2 lbs., was forcibly expelled. The placenta was large. The stertor subsided, and consciousness returned partly after the discharge of liquor amnii.

25th September. The dropsy quickly disappeared. She complained of defective sight for three or four days.

Mrs. Z. again pregnant. She has grown very stout, has albuminuria, and is estimated on the 20th August 1868 to be seven months gone. She has been complaining of vertigo; and there is œdema of the feet. These facts, and her previous history, induced her to apply for advice as to the propriety of bringing on labour. She apprehended that she should not live through the rest of her time. We recommended that labour should be brought on; and I appointed the 22d of August to see her at Bayswater. At 6 P.M. on that day I inserted a bougie six or seven inches inside the uterus. At 10 A.M., 23d, I found the bougie in the vagina; the cervix admitted three fingers; she had had slight pains and uneasiness in the night; head not presenting. At 6 P.M., in order to reach the uterus well, I had to pass the hand into the vagina, which was very capacious. I found the cervix would admit the hand. There had hitherto been little uterine action; but the presence of the hand excited pain. I ruptured the membranes; liquor amnii in great quantity flowed. The breech now presented in dorso-anterior position; the legs were extended on the chest. I therefore hooked down the nearest foot to convert it into half-breech; the extraction then was easy and rapid. The cord was round the neck; I liberated the arms, and delivered quickly a fine girl of about eight months' development; at first asphyxiated, it soon breathed, and cried vigorously. It was necessary to remove the placenta by hand, so that I knew the uterus was quite empty. In twenty minutes she complained of feeling faint. I found the uterus large, rising to the umbilicus; some blood escaping externally. I emptied the uterus by hand of large clots, and injected dilute perchloride of iron, and applied a firm pad and binder. At 8 P.M. she seemed safe. She passed a good night, and did well. The baby, which seemed when born well-formed and strong, became convulsed on the 24th, and died in the night.

Case IV. shows one peril attending premature labour, namely, the liability to descent of the cord. It is possible that the dilating-bags may displace the head from the brim. If this should happen, we must be prepared to turn.

CASE IV.—On the 16th May 1867, I attended with Mr. Berry at Kentish Town in the case of Mrs. A. I had delivered her about two years before with Mr. B. by craniotomy on account of pelvic contraction. In a subsequent pregnancy Mr. B. brought on labour at seven months. The child was very large, footling, and died in transit through the pelvis. Again pregnant, Mr. B. induced labour by detaching the membranes; then dilated the cervix by my bags; “they answered admirably.” A bunch of cord came down and a hand. The hand was replaced, and the forceps tried without avail. I saw her at 9 A.M. General state good; a large bunch of cord in the vagina with a perfect knot; pulseless. I passed my left hand into the uterus, seized the right foot and turned. The child was compressed in a ball. The head was large and firm;

the promontory projected considerably; some force was requisite to bring the head through; and it being dead, I perforated behind the ear, put a crotchet in the aperture, when delivery was easy. The uterus cast the placenta.

In this case we advised the induction of labour before the completion of seven months in the event of another pregnancy, as the children seemed to acquire advanced development earlier than usual.

Case V. shows how the head will gradually become moulded, and be expelled through a narrow pelvis. It is probable that in this case rapid extraction would have secured a living child.

CASE V.—On Aug. 8th, 1868, I accompanied a medical friend to see a woman in whom he had brought on labour, according to estimation, at seven months. He had turned, and could not deliver the head. When we got there the child was born; two or three pains had come on during his absence and expelled the head. The child looked quite of eight months' growth, and recently dead. The head was compressed laterally, giving a transverse or interparietal diameter of 3 in. The conjugate diameter was decidedly contracted. It was estimated by fingers at 3 in. The promontory projected almost vertically over the symphysis.

Case VI. is a good illustration of the use of the dilating-bags and of the forceps in minor degrees of pelvic contraction.

CASE VI.—The following history was brought to me from Dr. Williamson by Mrs. T. "She has had four children, and is now pregnant with the fifth. The first, I understand, was a forceps case. In her last three labours I myself attended her. Of these the first was very natural; in the second she was ill for two days, when she became exhausted, and I used the forceps, bringing away a dead child. In the last she was again delivered with forceps, as soon as the os uteri was sufficiently dilated, child also being dead. Now I was anxious to have your opinion as to the advisability of inducing premature labour in such a case, so as to save the child, as well as suffering to the mother."

Finding moderate contraction of the pelvis, and considering the history of the two preceding labours, and the possibility of the child she was now carrying having a large firm head if left to the natural term, we advised that labour should be induced at the end of seven months. A few days after our consultation, in December 1865, Mrs. T. took typhoid fever; hence the operation was postponed. She recovered favourably, and went her time, or nearly so. Labour came on spontaneously on the 5th of February 1866. She was very weak and nervous, contrary to her usual state. The head presented at the brim, but made no progress. I met Dr. W. at 6.30 A.M. on the 6th. The promontory projected; the conjugate diameter was estimated at

3.50"; the head presented in the third position. The forceps was applied in the transverse diameter of the pelvis; very moderate traction moved the head, and the uterus aiding, the child was soon born. Girl, alive, *small*. Placenta was cast. No hæmorrhage.

The child lived seven months, and died of diarrhœa.

In 1867 Mrs. T. was again pregnant. I received the following letter from Dr. W., dated October 22d: "On Wednesday last I brought Mrs. T. to see you. You will remember that I then told you that I had endeavoured to introduce an elastic catheter for the purpose of inducing premature labour, but without success. You then suggested tapping the membranes with a stilette in the usual way. This I did on the same evening about 9 o'clock, making a very small opening. The liquor amnii escaped slowly for forty-eight hours, and on Friday night labour commenced. At 7.30 on Saturday morning the os uteri had fully dilated; chloroform was administered; and I delivered her with the forceps of a male child. The infant was in a very weakly condition, but rallied in about half an hour; and since then both mother and child have continued to progress favourably."

Case VII. is a satisfactory illustration of the value of turning in moderate pelvic contraction as an accelerative measure.

CASE VII.—On the 21st November 1864 I met Dr. M'Donnell in the case of Mrs. R. at Dalston, in her second labour; the first had been very severe, the child being dead. Being at term, she was taken in labour on the 18th. She was of enormous size; for the last five or six weeks had been unable to lie down. There were twins. The first child presented footling; it required considerable force to bring the head through the brim; the child was dead; born at noon on the 20th. The second child presented head first; the labour made no progress. At 10 P.M. a severe fit of eclampsia came on suddenly. It subsided gradually, leaving the patient quite conscious. I could not discover that there had been any dropsy or other premonitory symptoms. Dr. M'D. had given ergot freely to accelerate the birth of the second child, and to this he attributed the convulsions. I saw her on the 21st at 12.30 P.M.; the head was at brim; the brim was contracted in the antero-posterior diameter, and generally in its circumference. I applied forceps; it locked well, but steady traction during half an hour had scarcely any effect. I perforated, and extracted in a few minutes by my craniotomy-forceps. The uterus contracted. The double placenta had two amniotic sacs. Ten minutes afterwards a severe eclamptic fit set in; it went off in stertorous breathing; the tongue was protruded. Both children were of full size.

Being again pregnant, it was determined to bring on labour at seven months. It was accordingly arranged that Dr. M'D. should start it on the 15th January 1866. He introduced an elastic catheter into the uterus twice without much effect; so that matters dragged on to the 19th, when I made an appointment for 2 P.M. on the 20th to complete

the labour. Mrs. R. was in good health; the vagina relaxed; free secretion of mucous membrane; the cervix thick, lips hypertrophied, admitting finger. The head presented. At 2.40 P.M. I commenced dilating the cervix; at 4 P.M. some dilatation had been effected; four fingers would enter; but she was very excitable; she bore down strongly, and then the uterine neck contracted sphincterically so as to squeeze even *one* finger. I punctured the membranes with a porcupine-quill; and then felt the placenta dipping down into the cervical zone behind and quite down to the edge of the os internum; a portion separated, and there was a little hæmorrhage. Further dilatation was effected by the large bag. I introduced the forceps; but the head was so far off, it was difficult to grasp it. Under uterine action a hand and the cord came down, and the placenta being prævia, I determined to turn. The patient was very excitable, so we gave chloroform. When anæsthesia was complete, I seized a foot and turned. The cord was round the neck; the head was detained about three or four minutes in the brim, and the pulsation in the cord ceased, and the heart beat very feebly. After birth the heart began to beat more strongly; and with friction on chest with brandy, and dipping in warm water, it breathed and cried in 20". The child, a boy, was large. It has grown up (September 1868).

Cases VIII. and IX. are very conclusive illustrations of the value of turning as a means of saving the child. Whenever the subject went her time craniotomy was necessary. On two occasions, when labour was induced, the child was saved by artificial dilatation and turning.

CASES VIII. and IX.—Mrs. L. On the 25th December 1864, I met Mr. Blackall in this case. She had been delivered of her first child by craniotomy by Dr. Oldham. She had now been in labour some hours, the head lying on the brim in transverse diameter, occiput to left. The left hand had come down by the side of the head. Passing my hand into the pelvis, I found the conjugate diameter to measure from 3.25" to 3.50"; the brim was a little more roomy to the right of the sacrum. I determined to turn. I found the right knee on the chest near the brim; I seized it, and pushed the head away from the brim towards the fundus uteri by external pressure. The version was easy. Having liberated the arm, the head entered the pelvis occiput to right, where there was most room. The head seemed quite to fill the brim. Moderate traction brought it through. It was in the brim about a minute; the pulsation in the cord had stopped. The child was born cyanosed; the heart beat faintly. The head was compressed laterally. Under excitation of the external respiratory nerves, respiration (crying) set in; in about five minutes the cyanosis went off, the child opened its eyes and cried vigorously.

The mother's external sacro-pubic diameter was 6.60." The child's bi-temporal diameter, after crying, was 3.50." The child has grown up to be a fine girl.

On the 7th April 1866, I was again called in to deliver Mrs. L. She had gone her full time, contrary to advice. She had been in labour all night. The membranes had been ruptured some hours; pains active, but have no effect. At 11 A.M. the head was resting on brim, easily movable. The conjugate contraction is very marked. *I now estimated it at scarcely more than 3.00"*. The head was large and firm, and I did not think it advisable to turn. I delivered by my craniotomy-forceps in about an hour. Child (boy) large. Placenta cast.

CASE IX.—On June 28, 1866, being again pregnant, she consulted me. She believes conception took place on the 19th May. Full term was estimated on the 20th February 1867. It was decided to induce labour on the 5th January, or about forty days before term. At 10 P.M. on that day I passed a No. 9 elastic bougie into the uterus; it slipped up between the wall of the uterus and the membranes quite 6.00". Next morning,—there had been some uneasiness in the night,—the os uteri admitted two fingers; the head presented. I scratched the membranes with a quill; the liquor amnii drained-off during the day; slight pains recurred, and at 10 P.M. the os would admit four fingers, but the cervical canal was long, and the os internum thick and firm. I applied the long forceps for 15" for the purpose of dilating the cervix; but this only partially succeeded. I determined to turn. I passed my left hand gradually through the cervix, in order to insure good dilatation for the quick delivery of the head. The cord was felt pulsating. I seized the left foot, disentangled it from the cord and brought down the breech; drew down a loop of cord to free it; liberated the sacral arm, then the pubic arm, and extracted the head rapidly; it came easily. Boy of eight months, apparently well-grown; asphyxiated at first; soon breathed and cried strongly under friction with brandy, and wrapping in warm flannel. The placenta was extracted by hand. No hæmorrhage. The whole was done under chloroform. The mother did well; and the child, as well as the first, are both thriving (September 1868).

Mrs. L. has been again pregnant (1868). It was arranged to bring on labour in the eighth month, but abortion at four months occurred.

Cases X. and XI. are typical instances of the success that may be looked for by following my proceeding. On two occasions Mrs. S. has been twice delivered at a predetermined hour of a living child.

CASE X.—On the 8th of February 1866, I met Mr. Jacobs in the case of Mrs. S. of Canonbury. She is a small delicate woman. I understood she had been delivered of her first child, which was very small, by forceps. She has now been in labour (second) twenty-four hours, making no progress; the liquor amnii has escaped twelve hours; the os is dilated. The head was on the brim. The external conjugate diameter measured 6.50"; internally, the promontory was very easily reached; the sacrum was much curved; I estimated the true conjugate to be barely 3.00". A wedge-like portion of the vertex was nipped be-

tween the promontory and the pubis. Considering the history of the first labour, I determined to try the forceps first; it locked well in the transverse diameter, but failed to move the head. I perforated, and extracted by my craniotomy-forceps without much difficulty. Placenta was cast. Child (boy) large. We recommended the induction of labour at eight months in the event of another pregnancy.

Mrs. S. being again pregnant, I arranged to meet Mr. J. on the 2d February, when it was estimated that she would be nearly eight months gone. On the evening of that day I passed an elastic bougie, which went in very easily 6.00" through the os uteri. Next morning there had been considerable mucous discharge and slight pains. Mr. J. reported some slight dilatation. On the 3d, we met in the evening to complete the labour. The os then admitted two fingers. I dilated further with the medium bag; the head presented. I ruptured the membranes, and allowed the patient to walk about for an hour. At the end of that time the cervix nearly admitted the hand; some pains had set in; but the contraction of the brim was too great to allow the head to pass. I passed in one blade of Beatty's forceps to form a channel to allow the waters to drain off. I then passed in the left hand, seized the left foot and turned. I allowed a fair time for the passage of the breech, and expedited the passage of the trunk and liberation of the arms. There was considerable arrest of the head at the brim, requiring traction. Girl of eight months, large, born flaccid, asphyxiated; but revived by frictions with brandy, dipping in warm water, and nursing in hot flannel. It cried healthily in 15", and was reared.

CASE XI.—Mrs. S. again pregnant. She aborted in August 1867. Early in next pregnancy she had albuminuria for a week; it quite disappeared. She was estimated to have completed seven months on the 30th May 1868; and the labour was fixed for this day. I had the assistance of Mr. Savery of Stoke Newington. I introduced a bougie into the uterus in the evening. It penetrated easily about 5"; the remainder was curled up in the vagina. We met by appointment on the 31st, at 5 P.M. There had been a little pain; and the os uteri admitted the finger easily. I inserted the medium-sized bag, and left it distended for 30". On withdrawal the os was found more dilated, and the membranes protruding. I tapped the membranes, and a free flow of liquor amnii ensued. The large bag was then inserted, and distended: it kept its place well; and at the end of an hour, the cervix was dilated enough to admit three fingers. The cord came down pulsating. We now gave chloroform and turned. The child was delivered in three or four minutes; it soon breathed, and was reared. Thus this lady has now two children.

Case XII. is eminently satisfactory as a proof of the value (1) of fixing the hour of delivery; (2) of artificial dilatation of the cervix; (3) of turning. Under any other mode of proceeding it is probable the child would have been lost. It is impossible in this case to exaggerate the happy consequences

attendant upon obtaining a living child. It shows that turning may still be successfully resorted to when the head has passed the brim, and when the obstacle is at the outlet.

CASE XII.—On the 4th October 1866 I appointed to meet Mr. Tait to induce labour in Mrs. B. at Canonbury. Her first child, large, had been delivered by craniotomy. In her second pregnancy labour was induced at seven months by Dr. Oldham, by puncturing the membranes; the child was expelled two or three days afterwards before Mr. T. could arrive; it was dead. She menstruated at the end of January; quickened in July; and was estimated to be eight months gone in the first week in October. On the 4th October at 6 P.M. I introduced No. 8 bougie three or four inches through the cervix; it did not pass readily, as the os was very high and far back. On the 5th at 3 P.M. there was increased mucous secretion; no marked dilatation; replaced bougie; 8 P.M., some little dilatation. The medium dilator was used; then the large one; at 10 punctured the membranes. The dilatation proceeded well till midnight, when it was sufficient to admit the forceps over the presenting head. This completed dilatation, and the head was brought to the outlet. Here it would make no further progress, owing to the great curvature forwards of the lower end of the sacrum, which narrowed the outlet in the conjugate diameter to 3·00"; and as the blades grasped in the oblique transverse diameter, the head, bulging in the conjugate direction, became more fixed. The blades slipped over the head. The Dublin (Beatty's) forceps did the same. I determined to turn, rather than perforate. I passed the hand into the pelvis, seized a knee, turned and extracted rapidly. Boy, born alive; it was soon vigorous. It passed the outlet without any difficulty. The placenta was cast. The patient was under chloroform throughout the operation. Both mother and child are thriving (September 1868).

CASE XIII. illustrates the application of turning in great contraction. Although the child was not saved, there was at any rate the satisfaction of having escaped craniotomy, and thus the certainty of destroying the child. Should it happen that the head will not come through by traction, there is still the opportunity of perforation, and, if need be, to apply the cephalotribe to diminish the head.

CASE XIII.—On the 30th December 1865 I met Mr. Blackman in the case of a deformed lady, about four feet high, in her first labour. She was estimated, counting from her last menstruation, to be quite three or four weeks beyond full time. She was a Jewess, and the estimation was probably correct. She had been in labour all night; no pains now; the head could not come down, owing to the contraction of the brim. The os uteri had been dilated by hand. The conjugate diameter was a little under 3·00". The promontory jutted forward so much that the brim was nearly divided into two spaces, meeting in front at an

angle. I tried the forceps with little hope; it effected nothing. I then perforated; during nearly two hours extraction was continued, taking away pieces of parietal and occipital bones. I then seized by the frontal bones, and brought it through the brim flattened in. There was great difficulty in bringing the head through the outlet, owing to the smallness and rigidity of the vulva. Further difficulty was experienced with the shoulders, from the great size and development of the child. I hooked one shoulder down first by the crotchet. Child, girl of great size, was estimated to weigh 12 lbs. The bones of the head were in a very advanced state of ossification. The patient did well. Induction of labour at seven months was recommended in the event of another pregnancy.

In 1866 Mrs. F. was again pregnant; she quickened in June. We agreed to induce labour on the 4th of October. At 7 P.M. on that day I met Mr. Blackman, and introduced a No. 8 bougie; it went up readily seven inches through the os uteri. On the 5th at 2.30 there was some uterine action, copious mucous secretion, and some dilatation of the cervix. We agreed to meet at 6 P.M. to finish the labour. I had made another appointment for a later hour the same day to complete an induced labour. At 5.30" P.M. I introduced the medium-sized bag; and at 6 the large one. There being full dilatation, I punctured the membranes. The head presented. The contraction was so great that the forceps held out no hope, so I turned. The head was delayed in the brim. The child (girl) born still; there was great compression in the bi-temporal diameter, where the head was nipped between the promontory and pubes. The child was of moderate size. The placenta had to be detached by hand; it had adhered near the os internum. The delivery was completed at 7.15 P.M.

The prospect of having a live child, even at seven months, seems small.

Case XIV. illustrates strikingly (1) the value of completing the labour within a given time; (2) the application of craniotomy, combined with the removal of the cranial vault, in cases of extreme pelvic contraction and distortion. But for this proceeding the Cæsarian section would have been unavoidable.

CASE XIV.—In Nov. 1865 I was requested by Mr. Cross of Petersfield to meet him in a case of extreme distortion and contraction of the pelvis. The patient was a dwarf, æt. 36. Soon after marriage she became pregnant. When about three months gone she had retroversion or rather locking of the womb in the pelvic cavity, causing retention of urine. This Mr. C. relieved by catheter, and gradually the uterus rose out of the pelvis. At this time Dr. Robert Lee went down to see her. When seven months gone, Mr. C., seeing the impossibility of her being delivered at term *per vias naturales*, advised the induction of labour. I accordingly went down on the evening of the 27th November. I found the lady of delicate feeble organisation; pulse 110. She was very dimi-

native, with considerable spinal deformity. The external conjugate diameter measured 5.30" only. The outlet was narrowed by the approach of the ischia, by the curving forward of the coccyx, and by extreme acuteness of the pubic arch, to such an extent that the hand could not enter the cavity. The cavity itself was of tolerable dimensions, but the promontory projected so much forwards as nearly to cut off the cavity from the upper or false pelvis. *The lumbo-sacral angle was within 1.50" of the symphysis pubis*; and there was not more than 2.25" on either side; the brim was also much contracted transversely. The pelvis, in short, was of generally infantine proportions as well as distorted. We dilated the cervix uteri, which was soft, lightly by the small elastic dilator for half an hour, at 9 P.M. At 12 P.M. we dilated a little more; and then, as the cervix admitted two fingers, the membranes were ruptured; and we left the patient for the night. Some vomiting followed the chloroform which had been given.

28th, 9.30 A.M. No uterine action. The cervix presented about the same amount of dilatation as last night. The large dilator was introduced, and kept acting for an hour and a half. This effected sufficient dilatation to admit the fingers freely; but still there was no uterine action. The perfect action of the dilator was impeded by the contraction of the brim, which received the pressure before it could bear fully on the cervix. The head was presenting, and movable above the brim. We deliberated between turning and craniotomy, but were compelled to abandon the idea of the former alternative, as there was no prospect of the child coming through alive, because it was likely to be more difficult of accomplishment, and therefore to tax more severely the endurance of the patient, whose power it was felt necessary to spare to the very utmost. I perforated with some difficulty, and got an excellent hold of the cranium posteriorly with my craniotomy-forceps. Steady traction during half an hour produced little effect beyond the sense that the bones, which were thin and yielding, were moulding. I passed a *mauvais quart d'heure* of anxiety lest, after all, the Cæsarian section might be our only refuge. The skull at length elongated, when the portion of bone seized came away. For this I was prepared; and now that the calvarium was a good deal broken down and diminished, and the rest very compressible, I got a fresh hold at the frontal bones and face, seizing close to the root of the nose. I then drew down the face, which came through the brim at the side of the promontory, the rest of the skull flattening-in upon the base and coming through the brim and cervix uteri without much difficulty. The trunk offered no obstacle. The whole operation under chloroform lasted an hour and a half. The uterus contracted, the placenta was soon withdrawn. For 15" the patient lay very weak; pulse feeble: unconscious. She then rallied. In the evening the pulse was 120; there was great want of power. She recovered well under the care of Mr. Cross, who subsequently sent me the following measurements: 1st, from one superior spinous process to the other 15"; 2d, across the front of the thighs, which were rather stout, from one trochanter to the other 14.5"; 3d, from one inferior spinous process to the other 11.5".

The operation was completely successful. The patient had not suffered so much or so long as in an ordinary labour. The anxiety was as to her power of reaction. The ordinary proceedings, by which labour must have extended over twenty-four hours at least, would, we were convinced, have so exhausted her physical and moral strength as to have destroyed her.

The two concluding cases, XV. and XVI., are selected from many similar ones in my note-books, to show the advantages to be gained in cases of placenta prævia, especially in the interest of the child, by the acceleration of labour by means of the cervical dilators and the forceps, or turning. The copious loss of blood attending this complication not only brings the mother into extreme peril, but the child, unless born quickly, is commonly destroyed by the asphyxia resulting from the want of the due supply of oxygenated blood to the placenta. Now, there is frequently a serious obstacle to the quick delivery. As in all premature labours, so in those in which it is provoked by the placenta being prævious, the uterus is suddenly called upon to execute a function for which it is imperfectly prepared. The cervix is rigid and thick. The dictum, that in these cases the os is always either dilated or dilatable, is one of the most mischievous fallacies that ever found currency in medicine. Often, indeed, when labour has advanced, and flooding has been going on, the cervix is found considerably expanded; but not less frequently, and even after profuse and dangerous loss of blood, there is scarcely any dilatation of the cervix at all. And in many cases, owing to the increased hypertrophy arising from its being brought within the range of the developmental stimulus, excited by the neighbouring placenta, the cervix is thicker and more unyielding than under ordinary circumstances. But the dogma, that it is dilatable, if not dilated, is accepted as a justification for proceeding to *forced delivery*, which means thrusting the hand through the cervix, and forcibly stretching it open. The records of obstetrics contain illustrations enough to prove the sad results of this violent practice.

Another condition that renders assistance necessary depends partly upon the same cause—the immaturity of the uterus, and partly upon the exhaustion resulting from loss

of blood. This is inertia of the uterus. It commonly happens that no expulsive action can be evoked.

Here again, then, we are met by two difficulties. We have to overcome the obstruction offered by the undilated cervix, and to supplement defective expulsive force.

One obstacle to the free dilatation of the cervix lies in the attachment of the placenta. For this reason, as well as for the physiological reasons connected with the arrest of the flooding, explained in my work on *Placenta Prævia*, the first step is to detach all that portion of the placenta which is adherent within the cervical or lower zone of the uterus. The bleeding then commonly ceases. The next step—and it should immediately follow the first—is to puncture the membranes. The third is to dilate the cervix *gently* and safely, as may be done with the water-dilators. The fourth is to deliver by forceps, or by turning, if efficient uterine action be absent; and it commonly will be absent, a state of paralysis being the consequence of loss of blood.

CASE XV.—On the 18th July 1866 I met Mr. Hicks in the case of Mrs. A. She was a pluripara, near term. She had been taken with smart flooding; the loss was sudden, profuse, and continued. Mr. H. had ruptured the membranes; liquor amnii in great quantity had escaped; but there was very little action of the uterus. The bleeding, however, was more moderate after the discharge of liquor amnii. When I saw her at 1.30 A.M. there was still some hæmorrhage; the pulse was low; the os just admitted two fingers; the cervical canal was distinct; the placenta still adhered near the os internum; head presenting. I swept my finger round freely, detaching the placenta from the cervical zone, and introduced the dilating-bags in succession for nearly an hour. At the end of this time, dilatation was enough to admit the forceps. There had been no hæmorrhage since the separation of the placenta from the cervical zone. Still there was no active uterine contraction. There was no contraction of the diaphragm or abdominal muscles to drive the uterus towards the pelvis; the consequence was, that the uterus and child sank down towards the chest. By external pressure on the abdomen and the forceps I brought the child through in 30". It was a boy of full size, lively. The placenta, which was very large, was cast. The patient recovered favourably.

CASE XVI.—On the 29th January 1865 I met Mr. Arthur at Stepney in the case of Mrs. A. She was a pluripara; had had two losses of blood within the last month. Being in the ninth month, copious flooding set in during the night. Mr. A. plugged. I found her at 8 A.M. not much prostrated; no pains. On removing the plug, I found the os dilated to the size of a crown-piece; the os externum uteri presented

a thin, sharp edge; the cervical canal was quite an inch and a half long; the os internum uteri was open to same extent as the os externum. It was covered by placenta, a flap passing over from the posterior to the anterior wall. The membranes were intact. I detached the placenta all round from the cervical zone to an extent of about two and a half inches from the os internum, then tore open the membranes, and applied my large dilator for forty minutes. At the end, although there were no pains of moment, the cervix was dilated enough to admit my hand. The head was presenting. I might have applied the forceps, but a foot being near, and all things favourable, I preferred turning. This was accomplished by drawing on the foot, and pushing up the head by external pressure. The child was quickly delivered. It was a girl; it soon breathed and cried. The placenta was removed, being cast; it was of large superficies, and must have reached to the fundus. Both did well.

The conclusions from the foregoing histories may be summed up in these propositions:

1. In induced premature labour the accomplishment of delivery is extremely uncertain as to time.
2. This uncertainty involves danger to the mother and child.
3. The immature condition of the uterus often entails defective contractile power and increased resistance to the passage of the child.
4. Hence it is desirable to aid the dilatation of the cervix, and to supplement the contractile power, to watch and control the course of labour throughout, and to bring it to a termination within a definite period.
5. This aid can be afforded safely and beneficially by the cervical water-dilators, and by the forceps and turning.
6. By the proper use of these accelerative means children may be saved which would otherwise in all probability perish.
7. In the management of cases of placenta prævia these accelerative means are of eminent value.
8. Labour may always be completed with safety within twenty-four hours.

ROBERT BARNES, M.D.

X. ON COUNTER-IRRITATION,

CONSIDERED IN REFERENCE TO THE REMOTE AND INDIRECT
EFFECTS OF LOCAL MORBID CHANGES.

THE rapid changes which are taking place in our knowledge of function and of disease make it necessary for us to review from time to time the rules which direct the application of remedies. The remedial branch of medicine, all-important though it be, can hardly yet be said to exist as a science. We hold to measures of treatment which our forefathers introduced, notwithstanding that our forefathers were led to them by suppositions now known to be erroneous. We allow the therapeutics of bygone generations to hold its place beside the pathology of to-day, and place in ill-matched apposition the art of one century and the science of another. Therapeutical traditions long survive the theories which gave them birth. In our use of drugs we are often unwittingly guided by considerations as mythical as the cabalistic reference to Jupiter with which we never fail to commence our prescriptions. The ancient doctrine of signatures taught that rose-leaves would stop bleeding because they were of the colour of blood; and to the present day infusion of the red rose commonly forms the basis of a styptic draught. The use of external applications is often based upon the effete extravagances of humoral pathology, and guided by doctrines as mysterious and as fanciful as those which were put forth by Sir Kenelm Digby, who professed to cure wounds by his "powder of sympathy," the efficacy of which was undiminished by distance, and which could be applied in one country for the advantage of patients living in another.

Rules of treatment once authoritatively placed in the code of medical practice are exceedingly difficult to displace.

They become the property of "practical" men, who are content to resort to the usage of their day without inquiring for the evidence on which it rests, and who hold to therapeutical traditions with a steadfast faith worthy of a less variable creed. The practice of such men is necessarily confirmed by their experience, since, while they are apt to take to themselves the credit of every improvement, they attribute all changes for the worse to the inevitable progress of the complaint. The murderous extravagances in the use of blood-letting and mercury which characterised the earlier part of this century could never have held their ground, had not the results of treatment been assigned to disease; and there probably remain many expedients in common use which would long since have been forgotten, were they not frequently credited with favourable events they have had no share in producing.

The *post hoc, propter hoc* argument, never more fallacious than in therapeutical matters, often connects together as cause and effect circumstances which have no more to do with each other than, to use a proverbial illustration, Tenterden steeple and Goodwin sands.* To suppose that excoriations of the surface of the body, in themselves trifling, can produce deep-seated alterations in unconnected though neighbouring organs; to imagine that bedaubing the chest with tincture of iodine can modify the course of tubercular disease in the apex beneath; or that a superficial vesication can pro-

* The story which associates Tenterden steeple and Goodwin sands as cause and effect has antecedents of such an eminently respectable character, that I may be excused for repeating it. It is told by Bishop Latimer of Sir Thomas More. It occurs in one of Latimer's sermons, from whence I have copied it with slight abridgment:

"Master More was once sent in commission into Kent to help to try out, if it might be, what was the cause of Goodwin sands, and the shelf that stopped up Sandwich haven. Thither cometh Master More, and calleth the country afore him, such as were thought to be men of experience, and men that could of likelihood best certify him of that matter. Among others came in before him an old man with a white head, and one that was thought to be little less than an hundred years old. Quoth Master More: 'How say you in this matter? What think ye to be the cause of these shelves and flats that stop up Sandwich haven?' 'Forsooth, sir,' quoth he, 'I am an old man, and I remember the building of Tenterton steeple, and I remember when there was no steeple at all there. And before that Tenterton steeple was in building, there was no manner of speaking of any flats or sands that stopped up the haven; and therefore I think that Tenterton steeple is the cause of Goodwin sands.'"

mote the restoration of a hepatised lung,—are views founded probably on no better reasoning than that which ascribed a formation the result of a profound geological change to an artificial modification in the surface of the neighbouring soil.

My object at present is to consider the custom which prevails of attacking the diseases of internal organs through the few square inches of skin which have the misfortune to lie within the shortest distance, “as the crow flies,” of the seat of the morbid change, notwithstanding that no continuity of structure exist, and that there be neither vessels nor nerves which maintain a direct communication between the peccant organ and the suffering cuticle. The custom may be likened to a practice said to prevail at an eastern court, where the children of the royal household are not punished in their own persons for any faults they may have committed, but the stripes are inflicted vicariously upon a boy unconnected with the royal lineage, who is kept for such uses.

John Hunter insisted upon the existence of what he termed “contiguous sympathy” between parts which lay in contact with each other though not continuous in structure, as between the bowels and the integuments of the abdomen, the lungs and the chest, the brain and the scalp, the testicles and the scrotum; but he explains the sympathy so defined as depending on no other connection than that which arises from the contact of separate parts, and which therefore amounts to much the same thing as his “continuous sympathy,” which was the term by which he expressed the tendency which morbid processes, particularly of an inflammatory kind, have to spread to structures which are in continuity with that first attacked.*

Other writers, however, have not been content with the simple doctrine, that internal organs may become involved in morbid changes which commenced in the walls of the cavities in which they are held, but have superadded an apocryphal creed, in which antipathy has taken the place of sympathy, which asserts that a superficial inflammation tends to counteract a change of the same nature in deeper structures.

Dr. Paris,† a philosopher as well as a physician, states

* Hunter's *Works*, Palmer's edition, vol. iii. p. 6.

† *Pharmacologia*, 1843, p. 243.

that "in all inflammatory affections of the internal organs, a blister placed on the contiguous surface affords great relief, not only by the discharge it occasions, but by a *transference of the inflammatory action to the surface.*"

Dr. Headland, in his recent work on the *Action of Medicines*, explains counter-irritation by the statement that "a powerful impression on any surface of the body seems to be capable of arresting and diverting, as it were, the attention of the system, and thus, for a time, of checking a morbid process."*

And looking at the details of practice at the present day, or within a recent period, we find that counter-irritation is used in the treatment of disease on the principles put forth by these authors; the upshot of which is, that the surface of the body and the organs beneath have a relationship which causes them to alternate in disease, one being relieved when the other is attacked.

Affections of the brain, whether supposed to depend upon excessive vascular action, as inflammation or congestion, or upon the contrary condition of anæmia; whether dependent on changes originating in the brain itself, or upon disorders, like renal disease and fever, which arise elsewhere; whether associated with recognisable causes, or with disturbances which we have not yet learned to distinguish,—all alike expose the patient to the chance of having painful excoriations added to his other sufferings.

If he be the victim of diabetes, his neck is liable to be blistered for no better reason than because that disorder is supposed to be sometimes connected with profound changes in the structure of the medulla oblongata.

Disorders of the spinal cord are sometimes treated by blisters and other irritants upon the skin which overlies the spinal column.

Affections of the eyes, particularly of an inflammatory sort, suggest to some practitioners the insertion of setons in the back of the neck.

Tubercular disease of the lung is held to warrant the application of iodine or blisters to the wall of the chest which

* *Action of Medicines*, 1867, p. 87.

overlies the part affected. Pneumonia and bronchitis are often met by similar applications.

Obstinate vomiting, upon whatever cause it may depend, is often regarded as a reason for placing blisters upon the epigastric part of the abdominal wall.

Cholera has been treated by a great variety of applications to the outside of the belly, among which may be mentioned irritating oils, nitric acid, boiling water, and heated irons.

It is not, however, necessary to multiply examples to show the general acceptance and application of the tradition of counter-irritation which insists that deep-seated disturbances of function or circulation are influenced advantageously by irritants addressed to the skin, providing only that they are applied within the shortest distance, in a straight line, of the organ which is the seat of the disorder. It does not appear to be necessary, according to this view, that there should be any direct connection between the deep organ and the overlying skin, or that the affection excited on the surface should be of the same kind as that of which the more important organ needs to be relieved.

It appears that this system has its foundation in the doctrines of the old humoral pathology, which, although containing a large admixture of truth, have been fruitful of mischievous practice. Each disease was supposed to exist as a separate essence, which was capable of movement from place to place. Our forefathers talked of "a pleurisy" as of a distinct entity, which, though now affecting the chest, might under certain circumstances transfer itself to another part of the body. The idea of the translation of disease still holds its ground as regards the exanthemata, in which the appearance of the rash is often coincident with a relief of the constitutional symptoms; and it is probable that there are other disorders of which the local manifestations leave one place to reappear in another. Tuberculous disease of the lungs has often been relieved on the appearance of an anal fistula.

These instances, however, only show that a specific change in one place may alternate with the same specific change in another. A deposition of tubercle near the rectum may lessen the tendency to the deposition of tubercle in the lung. A scarlatinal eruption may relieve scarlatinal delirium, or a

measly rash may relieve measly bronchitis. But the rule of translation is not applicable to any diseases excepting such as are caused by the presence, and relieved by the exit, of a morbid material; and the transference occurs in each disease as part of its natural course, and in a manner peculiar to itself. We have no power of producing the salutary movement, though we may sometimes hinder or prevent it.

In the majority of the diseases of internal organs which we are called upon to treat, we cannot expect any such transference of morbid action as occurs in the specific fevers. Inflammatory attacks usually depend upon some irritation or disturbance of circulation belonging especially to the organ afflicted, not upon any changes in the common fluids of the body. Meningitis is usually tubercular. Pneumonia is often associated with tubercle, or with valvular disease of the heart. Peritonitis generally depends on changes of long standing in one or other of the organs covered by the peritoneum; and in further detail it would be easy to show that acute inflammation is continually the sequel of chronic disease. A local inflammatory attack, the result of local causes, cannot be supposed to have any such reciprocity with the skin as holds in the case of eruptive fevers between the several parts of the body which are its chosen points of attack.

We may now proceed to examine into the evidence on which this system of vicarious therapeutics rests. What association in their morbid processes is there between the skin and the organs which lie in the serous cavities underneath? Do curative influences traverse the body in straight lines, as if thrust at point of bayonet, regardless of the ramifications of nerve and vessel?

If, on the theory advanced by Dr. Paris, we seek to "transfer the inflammatory action to the surface," should we consider proximity rather than anatomical connection? Does the essential principle of the inflammation, which it is our hope thus to remove from one place to another, travel by channels other than those which convey the natural fluids of the body? Have we to deal with a ghostly essence which moves unhindered by corporeal bar?

If, with Dr. Headland, we endeavour by external measures to divert the attention of the system from a mischie-

vous occupation; if we address measures to the less vital parts of the body of such an exasperating sort as shall induce the disease, like a ferocious animal, to forget its first object of attack and turn its spite upon the new assailant,—are we more likely to engage the attention of the enemy if we apply in its immediate neighbourhood, notwithstanding that it may have to come a long way round?

In order to deal with these and similar questions we must ascertain what is the extent of our knowledge upon the subject, and refuse to advance beyond its limits. We must act upon our information as far as it goes, and humbly confess our ignorance and our helplessness when we find that we have neither demonstrable laws nor conclusive experience to direct our conduct. It is not easy, nor is it necessary, to disprove the fanciful theories which have at different times been allowed to guide medical practice. Therapeutical maxims, if not clearly warranted by experience, must be discarded without ceremony, however supported by usage or tradition.

With regard to the therapeutics of counter-irritation, we may take a circumscribed and superficial lesion, and ask what we know regarding the nature and direction of its effects. What influence will it exert, and where? Does it, according to the theory which guides the practice of the present day, influence in an especial manner parts which, though structurally unconnected, lie in its vicinity?

Supposing a sore or superficial locus of irritation to have been established by nature or art upon a given portion of the surface of the body, we must ascertain what influences issue therefrom, by what channels they travel, and to what ends they tend.

It will be convenient to consider first the lines of communication which exist in the body; to ascertain the paths by which a local affection can influence remote organs or the system at large.

The several parts of the body communicate with each other by means of

1. The blood-vessels.
2. The absorbents.
3. The nerves.
4. Continuity or apposition of structure.

A local change may affect other parts by either of these channels. It will be necessary to review each of them separately, with an especial regard to the conveyance of such influences as may be salutary or remedial. Having in this manner analysed the modes by which each part of the body is brought to bear upon the rest, we shall learn how far the practice of counter-irritation is consistent with our present knowledge.

1. *Influences which travel by the blood-vessels.*

The veins may convey the products of disease from their primary seat and carry them in the direction of the circulation, to become sources of mischief in distant parts of the body. Thus pyæmic abscesses, and more rarely malignant growths, are produced in situations which are regulated by the course of the blood-vessels. But it is not necessary to dwell upon the function of the veins in conveying morbid matter from one part to another, since we can imagine no circumstances in which such a process could be employed therapeutically.

If a local sore be attended with a discharge, instead of adding to the contents of the blood-vessels, it may be the means of subtracting from them. The greater part of every discharge is produced at the expense of the blood. The portion which consists of the débris of solid tissue is necessarily small; all the rest must be supplied by the circulating fluid. The blood, therefore, which leaves the source of a discharge differs from that which went to it by the material which has been thus extracted.

When the flux is purulent, if it be in large amount and long-continued, such changes are produced by the withdrawal chiefly of alkali, as to cause waxy or "depurative" disease all over the body. If the discharge be such as to remove a large quantity of serum or of aqueous fluid, we can trace the result in the general demand for fluid of the kind which has been removed. The blood has a power of self-rectification in virtue of which it attracts to itself materials in which it is deficient. If in a case of dropsy a large quantity of serum is poured out into a serous cavity as the result of pleurisy or peritonitis, we may often observe its simultaneous disappearance from the

areolar tissue. Similarly, thirst follows excessive discharges of fluid from the bowels or kidneys.

When the discharge is small, the effect, though it may escape observation, must be equally real. The discharge is supplied by the capillaries of the affected part; in these, therefore, the deficiency in the blood is most marked. The same want must be likewise evident in the veins into which those capillaries empty themselves; the peculiarity of the blood being diminished as it mixes with converging streams, until it is lost in the general circulation. It may happen that a discharge too small to influence perceptibly the general mass of blood may yet produce a decided effect upon the plexus of vessels which have suffered the drain. If the discharge be of serum, serum will be wanting in the vessels of the affected part—a deficiency which will be apt to be supplied at the expense of any collections of serum within the influence of those vessels. Thus a superficial vesication, although too trifling to act through the general circulation, may drain the fluid from a serous cavity which has a vascular association with the affected surface. A blister over a distended knee-joint will fill at the expense of that cavity; the skin and the synovial-membrane being supplied by the same, or intimately anastomosing vessels. The same rule applies to many other joints, and in a less degree to some of the larger serous cavities, the pericardium in particular. As illustrating the local action of a drain of serum from the skin, I may mention the following case:

A child six years old had an effusion of fluid into both knee-joints as the result of rheumatism. The synovial membranes were visibly distended, and fluctuated to the touch. When this condition had lasted a fortnight a blister was put upon the right knee, which was the more distended. This produced considerable vesication, after which the joint, instead of being larger than the other, was found to be smaller. The left joint being now the larger was painted with a concentrated solution of iodine, which produced much irritation but no vesication, and no decided change in the size of the joint. A blister being now applied to this knee, the fluid diminished as it had done in the other limb—the left knee now becoming, as at first, smaller than the right. Subsequently a blister was put at the same time upon both joints; after which no trace of fluid could be detected in either.

In this case the removal of fluid was accomplished by vesi-

cation, not by simple irritation, and within the territory of the vessels which supplied the serum, not at a distance.

A local discharge, then, acts by changing the composition of the blood. This effect may be injurious or beneficial according to circumstances. When the discharge is of pus, waxy infiltration may result. When it is of serum, it may cause the removal of serum from elsewhere. Whatever the nature of the discharge may be, the first effect is within the territory of the blood-vessels which yielded it, the action diminishing as the altered blood is mixed with other streams, and only existing in a very reduced degree in the general circulation.

2. *Influences which travel by the absorbents.*

The function of the absorbents being, as far as we are aware, limited to the conveyance of matter from the circumference to the centre, it is unnecessary to consider their operation in any detail in connection with the salutary effect of local lesions. Insoluble pigments artificially placed under the skin, cancer, tubercle, and the syphilitic virus, all travel by these canals rather than by the blood-vessels; while the frequency of enlargement and congestion of the lymphatic glands in connection with discharging sores of almost every kind shows that the ordinary products of a broken surface are also liable to be taken up by these vessels.

This process, however beneficial to the locality from which the material is taken, is not likely to do good to any other part of the body, and can never be applied therapeutically. A local sore, therefore, cannot work medicinally through the absorbents.

3. *Influences which travel by the nerves.*

Many of the affections which are recognised as consequences of a local injury or disease appear to be conveyed by the nerves, and to reside essentially in the nervous system. Whether any influences so propagated can be directed to the cure of disease, is a question which may find its answer in the consideration of their character.

A local irritation, though it be unattended by any discharge which can exhaust, or by any secretion which can

poison, and though it be confined to structures which exercise no function immediately essential to life, may be productive of dangerous or fatal consequences.

According to the nature and extent of the primary lesion, the disturbances which result may be general throughout the system, or may be limited to particular nerves.

The following may serve as examples of a general change in the nervous system as the consequence of a local irritation.

If a thin layer of *fæces* or pus be spread over the peritoneum, a condition of collapse is produced which seldom fails to destroy life in a short time, although there may be no mechanical interference with the function of the abdominal organs. In such cases, indeed, death generally takes place more rapidly than would be the case from mere suspension of the functions of the alimentary organs. A small ulcer in the vermiform appendix, in itself unimportant, causes rapid death if it lead to effusion of irritating material over a considerable surface of the peritoneum. We can only attribute the result to the influence which the irritated surface produces upon the nervous system, the effect being chiefly manifested upon the nerves which regulate the circulation. The pulse becomes contracted, the surface cold, the features pinched, and, as appears after death, the left ventricle of the heart closely contracted.

Similar consequences may follow the burning or scalding of a considerable surface of cuticle, though the amount of skin destroyed may have been unimportant as far as regards cutaneous function. Death is produced, as in the former instance, by a failure of circulation.

Similar results have been known to follow accidents and operations which have been attended with no considerable loss of blood, and have involved no organ immediately necessary to life. And it would be easy to multiply examples of the fact that local disturbances affecting portions of skin, or of serous membrane, or other structures which could for a time be spared without serious injury to health, may be followed by the failure of circulation which constitutes collapse, although there have been no such loss of blood or its constituents as could suffice to produce the result.

If the patient survive the period of collapse, a febrile con-

dition may supervene, which is probably due, like the collapse, to an influence which the nerves convey.

Regarding collapse and reactionary fever as consequences affecting the entire circulation through the nervous system, we may next proceed to inquire what localised results are produced through the same channels by lesions too small to give rise to such general effects.

The more limited results of a local irritation, regarding such only as travel by the nerves, are of two kinds.

First, structural changes in the nerve-centres, more especially in that upon which the irritated nerve impinges.

Secondly, affections which have been described as reflex; alterations in the function of nerves distributed to some part of the body distant from the source of irritation, but connected with it by central attachments.

As examples of structural changes in the nerve-centres, as the consequence of a superficial irritation, the following cases may be mentioned.

It is well known that permanent softening of the lower part of the cord, with consequent paraplegia, not infrequently happens as the result of masturbation or excessive sexual indulgence.

A case is recorded in which acute inflammation of the brain followed the application of a ligature, which was intended for the subclavian artery, to the brachial plexus.

Tetanus, the pathology of which we are now beginning to understand, may be described if not as inflammation of the cord, as only one step short of it. In this case we are able to discern the important share which the arteries and their nerves bear in the production of change in the nerve-centres. A peripheral irritation is conveyed to the arteries of the cord, which become paralysed, dilated, and unnaturally gorged with blood. Portions of their accumulated contents traverse their overstretched walls and mingle with and disturb the surrounding nerve-tissue.

Epilepsy also appears to be due to a change in the innervation of the vessels of a certain part of the nervous system, in consequence of an irritation which may be conveyed from the periphery. It is believed that the vessels which are altered in capacity are those of the base of the brain.

Passing now to the second class of cases, a local irritation may be reflected by a nervous centre (according to the phraseology of the present day), and cause a "reflex" affection somewhere else. This reflex affection may be of three kinds; loss of motor power, loss of common or special sensation, inflammation.

As instances of the loss of motor power in consequence of a reflex irritation, the following examples may be mentioned. Urinary paraplegia is well known; a stone, some other source of irritation in the bladder, affections of the prostate, of the urethra, or even of the uterus, have been followed by paraplegia, which has subsided on the removal of the irritation. It has been shown in such cases that there has been no change in the cord appreciable to ordinary methods of examination.*

Paraplegia has likewise been known to occur as the sequence of intestinal disturbance.†

A child under my care had paralysis of one leg, after having had a severe chilblain upon the corresponding foot; and I may mention a similar case recorded by Dr. Graves, in which loss of power in one leg accompanied an attack of erysipelatous inflammation of the calf, and passed off upon the subsidence of the cutaneous affection.‡ In the preceding cases the motor nerves have been chiefly affected; but it not unfrequently happens that the sensitive faculty is similarly suspended or destroyed by an irritation acting primarily upon a distant part. This is especially the case with the retina; amaurosis has often been known to result from irritation conveyed by the fifth nerve. A splinter of wood in a carious tooth caused amaurosis, which was cured by the removal of the tooth. An injury connected with the supra-orbital nerve has been known to cause amaurosis, which ceased on the section of the nerve. The same symptom has resulted from the impression of cold upon the surface of the face.

A circumscribed irritation may, by a reflex action, cause inflammation, or in other words, paralysis of the vaso-motor

* See Brown-Séquard, *Paralysis of Lower Extremities*, 1861.

† Graves' *Clinical Lectures*, vol. i. p. 547.

‡ *Clinical Lectures*, vol. i. p. 557.

nerves, and consequent dilatation and repletion of the blood-vessels.

If the conjunctiva of one eye become inflamed, as often happens from the use of the microscope, the conjunctiva of the other eye will often undergo the same change though it has not been exposed to the irritation. A serious disease in one eye is not infrequently followed by destructive inflammation in the other.

It appears, then, that as regards "reflex" nervous affections they may consist of loss of motor power, loss of common or special sensation, or loss of vascular contractility, giving rise to congestion or inflammation. The alteration, of whichever kind it may be, occurs in a situation which is determined by nervous connections; the source of the irritation and the seat of the disturbance deriving their nerves from a common source. It appears in the highest degree probable, considering the nature and situation of these "reflex" affections, that they are really, one and all, occasioned by a morbid change, though perhaps only of temporary nature, in the nerve-centre which is the recipient of the irritation. It is not my object, however, to discuss at the present time the nature of reflex nervous affections, but simply to define their general character as loss of function in motor, sensory, or vaso-motor nerves.

It appears, then, that a local irritation may, by means of the nervous system, produce the following results:

1. Affecting the nervous system generally; collapse and febrile disturbance.

2. Affecting certain nerve-centres; structural changes in the nerve-centre upon which the irritation falls, mostly of an inflammatory or congestive nature; such as acute inflammation, chronic softening, or the congestion which is associated with tetanus.

3. "Reflex" disturbances, or changes in the innervation of parts of the body remote from the source of irritation, though associated with it by central connection. These affections generally consist of a loss of nervous function, such as paralysis, loss of common or special sensation, or inflammation.

Whether a local irritation produce constitutional disturbance, central change, or reflex loss of function, it does not

appear that, with our present knowledge, either of these consequences can be made subservient to the cure of disease. With regard to the reflex effects, which are the least mischievous, even they are of a kind which it can seldom be advisable to produce. And were such results as desirable as they are the contrary, they are not under our command; we can neither produce them at will, nor regulate their direction.

4. *Influences which travel by continuity or apposition of structure.*

A local sore or source of irritation may extend by contiguity of tissue; in other words, the original disease may spread.

A cancer or malignant tumour, by virtue of the energy of its nutrition, grows at the expense of surrounding structures; the continuous pressure to which they are subjected causes them to become atrophied, and eventually broken down and destroyed, to be replaced by the younger and more vigorous growth. Beside proceeding by this high-handed method, killing and taking possession, a malignant growth makes its way also by disseminating its germs into the vacant spaces around it, advancing not only by conquest but by colonisation. Each cell has an independent vitality, and a power of reproducing itself. Every outlying cell, every cell which by the movements of the body, or other chances, has become detached from the primary growth, becomes the centre of a new formation. Thus malignant growths cross the cavities of the pleura or peritoneum, cells formed on one side being rubbed off, and fixing themselves on the opposite membrane; in the same manner the same formation may cross the vagina or any mucous cavity of which the sides come into contact, passing from one wall to the contiguous part of the opposite wall. By these means, then, independently of vascular connections, a malignant growth may make its way from the surface of the body, through solid textures and across cavities, extending by continuity or apposition of structure.

Taking a disease other than malignant, such, for instance, as a circumscribed area of inflammation, such as might result from a superficial injury or ulceration, the process may travel

inwards through contiguous structures, much after the manner of a malignant growth. The products of inflammation may infiltrate adjoining tissues until they reach deeply-seated organs, which may then become the seat of a change resembling that which commenced around the original sore. An injury of the scalp may thus give rise to meningitis. The bone subjacent to the wound becomes infiltrated with pus, the dura mater underlying the bone takes on a suppurative process, which thence spreads to the arachnoid cavity; so that at last a state of suppurative meningitis has resulted from an injury at first confined to the outer coverings of the skull. In the same manner pleurisy may result from superficial injuries or morbid affections of the chest-wall, or peritonitis from apparently trifling alterations external to the peritoneum. This affection has been known in several cases to result from very trifling operations in the neighbourhood of the peritoneum, such, for example, as the destruction of vascular excrescences near the orifice of the female urethra. In such cases there can be little doubt that the fatal inflammation has been set up by a simple extension of the suppurative process through continuous or apposed structures. I might instance a case in which an operation for fistula was followed by the infiltration of pus into the cellular tissue around the rectum, which in its turn set up fatal peritonitis. But it is not necessary to multiply cases to prove that the inflammatory process set up by a superficial lesion may extend by simple contiguity to a neighbouring serous membrane. The spreading of inflammation from one structure to another appears to be due to the fact that inflammation may be excited by the irritation of inflammatory products, so that the process may be conveyed by contact, after the manner of a malignant growth. This appears to be the truth, which, as far as morbid actions are concerned, is contained in the doctrine of contiguous sympathy.

We may now place in small compass what has been advanced, and review the consequences which can be recognised as springing from a circumscribed morbid process.

By vessels.

As a means of withdrawing material from the blood, a dis-

charging sore may produce various effects according to the nature of the discharge and the circumstances of the case. A loss of pus may cause mischievous deterioration of the blood, and consequent organic change. When the discharge is serous, it may lead to the absorption of serous accumulations in the vicinity, and in appropriate cases be remedial.

A sore may produce various morbid changes consequent upon the contamination of the fluids of the body by the absorption of morbid products.

By nerves.

Independently of discharge, a local irritation may, if extensive, cause collapse and febrile disturbance.

It may cause change in the nerve-centre upon which the irritation falls, such as to give rise to acute inflammation, chronic degeneration, or the vascular alterations which belong to epilepsy and tetanus.

It may cause "reflex" loss of function in especial nerves which are associated by central connection with the nerves which are the channels of the irritation, and so occasion localised paralysis, loss of sensibility, or inflammation.

By contiguity.

A superficial morbid process may extend by contiguity, and occasion a change of the same nature in deeper structures.

We have inspected all the lines of communication which traverse the body, and found none which are adapted to convey the traditional virtue of counter-irritation in the direction which it is reputed to follow.

When therapeutical results ensue from an artificial discharge, as when vesication removes a serous effusion, the course of the salutary action is guided by the distribution of the blood-vessels. When simple irritation has been established—a proceeding of which we can recognise none but injurious effects—the nerves supply the route by which it travels. When, irrespective of vessels or nerves, a deep organ is influenced by a superficial change, the process is limited to extension by contiguity, the deeper structure participating in

the morbid change which began on the surface, or in the inflammation consequent upon it.

Although in certain specific diseases the morbid action sometimes transfers itself from one place to another, we cannot expect such a translation except in disorders which, like measles and scarlatina, depend upon a circulating and erratic poison. And even under these circumstances we can rarely, if ever, produce artificially the desired transfer.

A local application has a local action; it warms or cools, soothes or stimulates, or produces its appropriate effect, be it what it may, upon the tissues which lie within the short range of its immediate influence. If the skin be made to pour out a serous discharge, the serum may be withdrawn from a neighbouring accumulation. But we have no knowledge which will warrant us in ascribing any remote or indirect remedial action to the excoriations and other local inflictions which have been practised under the idea of counter-irritation. We have no reason to suppose that we can under any circumstances lessen an internal inflammation by exciting inflammation of the superincumbent but disconnected skin. Unless there be some great undiscovered law, of which pathology shows no trace, and of the existence of which clinical experience has given no proof, we cannot hope for benefit from counter-irritation. We may therefore cease to apply irritations to the skin of the head in disturbance of the brain; to the back in affections of the spinal cord; to the chest in diseases of the lung; and in general forbear to apply remedies to parts which have no direct vascular connection with the structure diseased, unless the remedies are of such a kind and of such magnitude as to bring the whole system under their influence.

W. H. DICKINSON, M.D.

XI. A HYPOTHESIS AS TO THE ULTIMATE DESTINATION OF GLYCOGEN.

It has been known for more than ten years that there is a constant formation going on in the healthy liver of a non-nitrogenous substance, to which Bernard, its discoverer, gave the name of glycogen. It has also been ascertained more recently that there is a consumption of non-nitrogenous matter in the muscles during their contraction, and that it is to the oxidation of this non-nitrogenous matter that the muscular force is almost, if not entirely, due. These two facts have never, so far as I know, been supposed to stand in any near relation to each other. I propose, however, in this paper to suggest an hypothesis, according to which they would be connected with each other in the closest degree, the starch or glycogen being in fact the substance which is consumed in the muscles, and the liver thus furnishing the fuel from the oxidation of which the muscular force is derived.

I am aware that I have only a crude hypothesis to offer—one, however, for which I think many established facts plead. I venture, therefore, to set it forth, in the hope that some more competent chemist than myself may think it worth while to submit it to verification.

For the sake of clearness I will first state my hypothesis in the barest form; and having done this will then take each separate portion of it in succession, and point out what grounds there are for accepting it.

My hypothesis, then, is this. The liver is constantly producing fresh supplies of a non-nitrogenous substance, variously called glycogen, heptatin, animal starch. α . This starch unites with some nitrogenous substance, probably with

fibrin or some derivative of fibrin, and forms a complex nitrogenous compound, which leaves the liver by the hepatic veins. β . This complex substance is taken up by the blood-corpuscles, and goes to form their peculiar contents. γ . By the blood-corpuscles it is conveyed to the muscles, and is by these appropriated. δ . The substance thus furnished by the liver to the muscles is again split up during muscular contraction into its constituent parts. The results of this decomposition are a nitrogenous substance, myosin, and a non-nitrogenous substance, which is either lactic acid or something very readily converted into lactic acid. ϵ . This splitting-up is perhaps in itself a source of force, because the atoms in the myosin and lactic acid are more closely combined than they were in the complex substance which existed before the splitting-up occurred. ζ . But a second source of force is the oxidation of the lactic acid by means of the oxygen which is stored up in the muscle-tissue in loose combination with its colouring matter. By this oxidation of the lactic acid carbonic acid is produced, and this carbonic acid, as well as any excess of lactic acid, is carried away by the venous current. η . What becomes of the myosin? This also quits the muscle, probably in the form of fibrin; and it is owing to this that the venous blood which leaves a muscle—especially a muscle which has been tetanised—is much richer in fibrin than the blood which goes in. θ . The fibrin thus produced is, however, not consumed in the same way as the lactic acid, for there is no increased excretion of nitrogen produced by exercise. It is carried in the venous blood through the body, and again reaches the liver, where such portion of it as is still in a fit condition is used for combination with a fresh supply of glycogen, and again passes through the same series of combinations and liberations as I have already described.

Thus the fibrin serves the office of a carrier of non-nitrogenous fuel from the liver to the muscles. When it has done its work it returns empty-handed to the liver, is intrusted with a fresh supply of starch, and so on for an indefinite period.

Having now stated my hypothesis, I proceed to examine its separate statements in succession.

α. That a substance resembling ordinary starch is in health constantly produced in the liver was demonstrated many years back by Bernard, and is beyond dispute. As this starch does not constantly accumulate in larger and larger amounts in the liver, it must in some way or other be consumed as fast as formed. Bernard, as is well known, supposes that it is converted into sugar, and leaves the liver in that form. Dr. Pavy, from his experiments, arrived at the conclusion that this is a mistake, and that, whatever may be the destination of the starch, it is not in life converted into sugar. Dr. Pavy's results were not generally accepted, but they have since been confirmed by the independent investigations of Dr. M'Donnell. The starch, then, does not leave the liver as sugar. Neither does it leave it as unchanged starch, for otherwise it would be easily detected in the blood of the hepatic vein; but there it has never yet been found. In what shape, then, does it quit the liver? It seems most simple to suppose that *it unites with some nitrogenous substance, probably fibrin or some derivative of fibrin, and that it leaves the liver in this combination.* The chief grounds for this supposition are, firstly, that fibrin disappears from the blood in large quantities during its passage through the liver. There is little or no fibrin, in fact, in the blood of the hepatic veins. This disappearance of the fibrin cannot be accounted for by supposing it to be consumed in the formation of the bile, for the amount of nitrogen in the biliary secretion will account for only a very small proportion of that of the missing fibrin. (M'Donnell, *Functions of the Liver*, p. 30.) Secondly, the liver starch certainly can, and often does, unite in the living body with some or other nitrogenous compound. It is found in such a state of combination in the muscles of the fœtus; it is found also in such a combination in the liver itself. Thus I have heard Bernard, in one of his lectures at the College de France, admit that a small proportion of glycogen leaves the liver without change into sugar, being dissolved in the blood "*à la faveur des matières albuminoïdes*," and probably in combination with them; and also that when glycogen is present in only small quantity, as in the liver when it first begins to act as a starch-former, it often escapes detection, because its presence is disguised by

the albuminous substances with which it is probably combined.

It would appear that glycogen can unite with nitrogenous matter in several degrees of closeness. Thus, if the *sabot* of a foetal calf be examined, three different conditions will be found, accordingly as the horny matter is more or less fully formed. In the earliest stage there is found a gelatinous substance from which starch may be extracted. In a stage rather more advanced no starch can be extracted; but on boiling the substance with strong acids sugar may be obtained. Here the starch has become more complex by combination with nitrogenous matter, and can no longer be separated except by powerful reagents, which, in separating it, convert it into sugar. In the third stage the horn is fully formed, and no starch nor sugar can any longer be obtained from it.

It may be said, that if the supposed combination of starch and nitrogenous matter really occurs in the liver, we ought to find the resulting compound in the blood of the hepatic veins. Now, Dr. M'Donnell (*Functions of the Liver, &c.* p. 34) has shown that there does really exist in the hepatic blood a substance which may be fairly regarded as this resulting compound. This substance much resembles globuline. It is found in ordinary blood, from whatever vessels derived; but it is most abundant in the blood which comes from the liver during digestion by the hepatic veins. The blood of the vena portæ is no richer in it than the blood of the ordinary veins, and these contain less of the substance than do the arteries. Dr. M'Donnell believes that this substance is formed by the combination of glycogen with nitrogen; and this view is corroborated by the fact that the vessels which next to the hepatic veins are most richly supplied with this substance are those of the placenta; that is, the vessels of an organ which is known to be, as the liver, the seat of an abundant formation of glycogen.

β. *The substance formed in the liver by the combination of glycogen with fibrin is taken up by the blood-corpuscles, and goes to form their peculiar contents.* In support of this I would urge that the blood-cells do undoubtedly obtain from the liver some or other nitrogenous substance;

for it has been shown by Lehmann that the cells of the hepatic veins are richer in nitrogenous matter than those of the vena portæ (Funke, i. 160); and that the nitrogenous matter which they appropriate is the substance formed by the union of glycogen and fibrin is rendered highly probable, not only by the resemblance of this substance to globuline, but also by the “remarkable discovery made by Lehmann that the contents of the blood-cells, the hæmatocrystalline, can be broken up into a nitrogenous substance which has not been fully investigated, and a variety of sugar closely corresponding to, if not identical with, glycoze” (Day’s *Chemistry*, p. 116). As a minor argument, I would observe that the never-ceasing production of glycogen points to its being required for some important and never-ceasing want; and that such a want is that of material for the maintenance and development of the blood-cells. For it is tolerably certain that fresh blood-cells are constantly being produced in large quantities, and that in the performance of their functions they undergo rapid degradation or destruction, and require constant renovation.

γ. *The substance thus appropriated by the blood-cells is given up by them to the muscles.* The striking resemblances in composition between the blood-cells and the muscle-juice render this part of the hypothesis very probable. The blood-cells, as is now well known, present a great contrast to the liquor sanguinis in the salts which they contain. In the cells there is abundant potash, little or no soda. The reverse is the case with the liquor. In the blood-cells there is a great preponderance of phosphates over chlorides; and here again the proportion is reversed in the liquor. Now, these peculiarities of the blood-cells are repeated exactly in the muscle-juice. In this, as in them, we find abundant potash and phosphates, deficient soda and chlorides. Again, there is in the muscle-juice a colouring matter which appears to be identical with the hæmoglobin of the blood-cells (J. Ranke, *Physiol.* p. 538). It is affected by oxygen, just as is the hæmoglobin of the cells, being turned by combination with it to a bright red tint; while in the absence of oxygen it is of a much darker hue. All the reagents which in the living body change the colour of the blood-cell change also the

colour of the muscle. Carbonic oxide, for instance, turns the muscle, as it does the cell, to a bright scarlet. Again, the muscle-juice, or rather its chief constituent, can, like the blood-cell contents, be split up into a nitrogenous substance and a non-nitrogenous substance or substances. When fresh muscle-juice is obtained and allowed to stand, it separates spontaneously into these constituents, the nitrogenous substance (myosin) coagulating, and the non-nitrogenous substance being found in the form of lactic acid (Kühne). Besides these chemical resemblances of blood-cell and muscle, another argument to the same effect is furnished by the important fact, that, in the passage of the blood through a muscle the cells become less numerous. “*Dans les muscles les globules deviennent plus rares,*” says Bernard (*Liq. de l'Organ*, i. 460). So also it is stated by Lehmann, that the small veins contain more fibrin and more water, but fewer cells, than the arteries (Frey's *Hist.* p. 146).

δ. *The substance derived by the muscles from the blood-cells is during their contraction split up into a nitrogenous substance, myosin, and a non-nitrogenous substance, which is either lactic acid or some substance easily converted into lactic acid.* In support of this statement I need say little, for it is generally accepted by the modern chemical physiologists. Muscle-juice left to stand after being squeezed out of the tissue (Kühne), or a muscle passing into the condition of rigor mortis, or a muscle that is violently contracted (Du Bois Reymond), becomes acid, and in each case the acidity is due to lactic acid. In the expressed juice and in the rigid muscle after death it is known that the lactic acid results from such a splitting-up as I have mentioned. It is assumed, with great probability, that the acid has a similar origin in the contracting muscle; and this assumption is strengthened by a number of cogent arguments, which I will not give here at length, contenting myself with referring the reader for a brief exposition of them to Herrmann's *Grundriss der Physiologie*, p. 225. It appears doubtful whether the lactic acid is the immediate result of the split, or whether there is not first some other non-nitrogenous substance which is rapidly converted into lactic acid. A reason for suspecting this to be the case is, that when fresh muscle-juice is left to

stand, and the myosin separates and begins to coagulate, the juice does not always become acid immediately, but there is sometimes a slight interval of time, during which it retains its alkalinity (Kühne). It is possible that the substance which thus precedes the lactic acid is some form of glycose, for it has been shown by J. Ranke that the amount of glycose contained in a muscle is increased considerably by muscular contraction.

ε. *This splitting-up of the substance into myosin and lactic acid is perhaps in itself a source of force*; for although the usual source of active force in the living body is an oxidation, this is not invariably the case. Any chemical process by which stronger affinities are satisfied than were satisfied before the process, sets force free. As an example of such a liberation of active force may be cited the alcoholic fermentation of sugar. The sugar is converted into alcohol and carbonic acid without any oxidation whatsoever, and in the process heat is disengaged. This is because the particles of carbon, hydrogen, and oxygen are in closer chemical union in the alcohol and carbonic acid than they were when loosely combined to form a particle of sugar (Herrmann, *Grundriss der Phys.* p. 190). In the same way force in some shape is perhaps set free when the complex nitrogenous substance in the muscle-juice splits into myosin and lactic acid, because stronger chemical affinities are satisfied after than before the split.

ζ. But only a portion of the muscular force is derived from this source. *A second and more important source is the oxidation of the lactic acid.* It is a well-established fact that a muscle consumes oxygen and produces carbonic acid, and that this consumption and production are notably increased during contraction. It is not positively ascertained what is the substance at the expense of which the carbonic acid is formed; but as it is known that lactic acid is produced during muscular contraction, and that it does not, under ordinary circumstances, accumulate in the muscle-tissue, it is only reasonable to suppose that this is the substance which undergoes oxidation. The carbonic acid thus formed, and also any excess of lactic acid which may escape oxidation, are carried off, as fast as formed, by the veins. This is at least the case

under ordinary circumstances; but when contraction has been violent and prolonged, as in tetanus, the lactic acid is produced in too large amount for sufficiently rapid removal. It accumulates, therefore, in the muscle-tissue, and produces in this an acid reaction.

η. It is less easy to conceive what becomes of the myosin. Herrmann, indeed, supposes that it remains behind in the muscle, and combines with a fresh supply of some unknown non-nitrogenous substance conveyed to it by the blood. I imagine it to be more probable that it is carried off with the lactic and carbonic acid by the veins, and that it is carried off in the shape of fibrin. The reason for supposing this is, that I do not see how otherwise to explain the ascertained fact that fibrin is always being formed in the muscle, and is formed in greater quantity than usual when a muscle is in contraction. For Brown-Séquard found, many years back, that when defibrinated blood is injected into the arteries of a separated limb, it issues from the veins charged with fibrin, and that this is especially the case when the muscles of the limbs are tetanised.* Similar results have been obtained by Bernard.†

I need hardly point out that the close resemblance between myosin and blood-fibrin, both in their ultimate composition and in their great tendency to coagulate, is strictly in accordance with the above view of their relationship.

θ. The fibrin which is thus set free during muscular contraction is not oxidised. For it has now been established beyond all question that muscular exertion is not attended by any increased excretion of nitrogen. Other conditions being alike, the amount of urea excreted by a man will be the same, or practically the same, whether he walk to the top of Mont Blanc, or spend the day in an arm-chair. The force is derived from the combustion of exclusively non-nitrogenous matter. What, then, becomes of this fibrin? As a very large amount of it disappears during the passage of the blood through the liver, and cannot be accounted for by the nitrogen of the bile, it is not, I think, improbable that this same fibrin, or such part of it as is still in a fit condition,

* *Journal de la Phys.* i. 299.

† *Leçons*, 1859, i. 460. "Dans les muscles le sang se charge de fibrine."

enters there into combination with a fresh supply of glycogen, again furnishes the blood-cells with fresh material, and again is carried to the muscles. So that, as I said at the beginning of this paper, the fibrin would act as a carrier backwards and forwards between the liver and the muscles, remaining itself unconsumed, but providing the latter with constant supplies of non-nitrogenous matter, from the combustion of which they may obtain force.

I trust that I have now shown that no one of the successive propositions which form the hypothesis set forth in this paper is in itself improbable, and that for several of them a greater degree of certainty may be claimed. It remains to examine the hypothesis as a whole, and to see how far it squares with ascertained medical and physiological facts. It appears to me that it harmonises in a remarkable degree with many and various well-known phenomena, and supplies a rational interpretation of them. I will very briefly mention some of these.

1. Of all chronic ailments, none are characterised by such muscular prostration and utter incapacity for exertion as those which affect the liver. This is at once intelligible if the liver be the source on which the muscles rely for their supply of combustible material.

2. There is nothing more apt to produce hepatic congestion in a healthy man than prolonged muscular inactivity. The forced repose of a patient with a broken limb not infrequently causes jaundice. On the other hand, there is nothing which more simply depletes an overloaded liver than muscular exercise. These facts are again in harmony with the hypothesis. During inactivity the muscle-fuel accumulates in the liver; during exercise it is consumed.

3. When a muscle has been kept in a state of forced inaction for a considerable time—a muscle, for instance, of a limb paralysed by nerve-section, or a muscle of the foetus motionless in the womb—it is found that a considerable amount of glycogen may be obtained from it, precisely the same in all respects as the glycogen of the liver. None such can be obtained from the muscles of an adult animal that have been used in the ordinary way; so that it would seem certain that glycogen is in some way or other consumed in the

muscles during their activity. Whence is this glycogen derived by the inactive muscles? It may of course be that it is formed on the spot, in the muscles themselves. But, considering that there is in the adult a special organ, the liver, for the formation of glycogen, and in the fœtus, before the liver can act, another organ, the placenta or the amnion, in which a similar production goes on, it seems more probable that the glycogen is derived from these organs than that it is self-manufactured by the muscles.

As to the accumulation of the glycogen in the palsied muscles, I imagine that it takes place in the following way. The myosin can combine with glycogen in different amounts. When the combined substance is first deposited in the muscles by the blood-corpuscles, the proportion of glycogen is at its maximum, and at this stage the glycogen, or some of it, can be easily separated from the myosin and obtained free from nitrogen. This is the state of the palsied or fœtal muscle. But when the muscle contracts, some of the glycogen separates and is consumed, leaving the myosin in combination with a smaller amount of glycogen, which can no longer be obtained so readily in a separate condition. It is only when all the glycogen has been separated from the myosin, that this latter is itself carried off in the form of fibrin.

WILLIAM OGLE, M.D.

XII. CASE OF POISONING BY STRAMONIUM.

THERE have not been many cases recorded descriptive of the symptoms occurring in poisoning by stramonium. The following, I have thought, may be interesting, both from the general symptoms observed, and from one or two peculiarities connected with it, not noticed in those cases which have been narrated.

Early one morning I was called in great haste to see a gentleman in lodgings at Torquay for the winter, who, I was told, had just been found apparently dying of "some unusual sort of disorder," and that no cause could be assigned for the state in which he had been discovered about ten minutes previously. The only account I could obtain during the short time of hurrying to his assistance was that the old gentleman had gone to bed rather late the night before, fearing the approach of an attack of asthma, to which he was subject, and for the relief of which he had come to Torquay; that during such attacks he always put off going to bed as long as possible, and oftentimes walked the room a great part of the night, only lying down occasionally. He had taken a light repast of bread-and-butter and coffee about 11.30 P.M., and had then gone to his bedroom. He had been heard pacing his room and making an unusual noise up to a late hour. The last time he was heard moving, as near as could be judged, was 4 or 4.30 A.M. About seven o'clock they rapped at his door as usual, but getting no answer, they concluded he was asleep, and thought that, after his restless night, they would not disturb him for another hour. About eight they knocked again, and obtained no response. The landlady then resolved to take to him his usual morning cup of coffee, and tried to open his door, but found some resistance. She pushed it open by force, and then saw the old gentleman lying on the floor in his night-shirt, with his feet at the door, as if he had been pushing against it, and his head right under the bed.

She spoke to him and tried to make him reply, but finding him cold and apparently dying, sent in breathless haste for me.

I was at the house in about seven or eight minutes, and on going to the bedroom found a strange scene of disorder as regards the furniture; and the old gentleman, probably about seventy years of age, a fine tall, stout, well-built man, in an alarming state of collapse, just in the position in which he had been discovered. The features were sunken, the skin icy cold and covered with clammy sweat, the hands and feet livid (the former much bruised), no pulse to be felt at the wrist, the heart's action excessively feeble and intermitting, the pupils so contracted as scarcely to be discernible—smaller than I have ever seen in a cat's eye.

I immediately ordered him to be put into bed and well loaded with blankets, and then set to work, with all the assistance I could get, endeavouring to restore warmth and circulation.

It was clear that he was suffering from the effects of some powerful depressant poison, though no bottle could be seen in any part of the room; but the apartment was in such confusion that it was difficult to find anything. The plan of treatment was obvious enough, whatever had been the cause of illness. All the various depressant poisons flashed across my mind—belladonna, digitalis, aconite, nicotine, prussic acid—but I could not waste time in trying to discover the clue at that moment: life was flickering. I had frictions applied to the arms and legs and over the region of the heart, hot fomentations to the whole of the abdomen, sinapisms to the feet, hands, and nape of neck. I endeavoured to pour a little brandy down the throat, but there was not the slightest attempt or power of swallowing.

He remained perfectly unconscious and could not be roused, paid no heed to the loudest shouting, did not feel the smartest pinching; while the arms and legs, when lifted, fell flaccid and lifeless. There was terrible dyspnœa; indeed, the function of respiration was rather a succession of deep gasps and sobs; and the little vitality still left in him seemed becoming rapidly expended by the tremendous effort and increasing struggle to breathe.

The remedies—particularly the vigorous frictions—were

continued without intermission for an hour before any warmth could be noticed, or any change for the better perceived. The first evidence of returning power was that of a slight gurgling in the throat, induced by my pouring a teaspoonful of brandy into his mouth, and then tipping the head gently back to help it down the throat. This gurgling continued for about two minutes, when I thought he made a slight attempt to swallow; but the presence of the brandy instantly produced a violent spasm, and it was again seen running from the mouth.

After about two hours of this really hard work there were signs of returning animation. The pulse was perceptible at the wrist, the heart's action became firmer, the breathing less gasping, and the surface warmer. I had an immensity of trouble still to get him to drink the smallest sips of brandy-and-water. Every attempt at deglutition brought on a spasm, evidently from violent constriction of the pharynx. As the powers of life gradually returned, there was a constant sort of gulping, as if striving to swallow even when no fluid was being given; and it appeared to be the cause of much distress to him, though he was still unconscious. It was clearly useless to think of using the stomach-pump under existing circumstances; and as vitality seemed gradually returning, I watched my opportunity for administering a good dose of sulphate of zinc as soon as it could pass the fauces.

This, to my great joy, speedily caused the ejection of the whole contents of the stomach, viz. a moderately large amount of undigested bread, and a dark grumous-looking fluid smelling unmistakably of coffee and of some medicinal mixture not unlike stale tincture of rhubarb. After the contents of the stomach had been thus emptied he gradually rallied, opened his eyes, and stared wildly about him, though evidently unable to see anything, the pupils still intensely contracted; and on waving the hand before them he never blinked or took the least notice.

The frictions and fomentations were still continued, and hot bottles applied to the feet; the sinapisms apparently became an annoyance to him. I now managed to give him a little ammonia and æther, as he began to refuse the brandy. There was still the same terrible spasm of the throat at each

attempt to swallow, like that in hydrophobia; but still the fluids did pass eventually, after much struggling; but there was no other kind of convulsive movement in any other part of the body. The ammonia and æther draught was vomited almost instantaneously; and at the same time from this effort a large quantity of peculiarly offensive urine passed involuntarily. The vital powers now gradually returned; and as soon as he could get down brandy-and-water with less spasm, I induced him to take an ounce of castor-oil, hoping that a mild unirritating purgative would bring from the bowels whatever offending matter still lurked there.

About 12.30 the pupils began to expand and vision gradually returned. He looked inquiringly around the room, and with some degree of terror, apparently wondering at the strange scene dawning upon him.

He continued gulping, as if striving vainly to get rid of some substance in the throat; and he made ineffectual attempts to speak, but not a syllable could he articulate, the mouth was too dry and parched, the secretion of saliva being evidently entirely suspended.

Before one o'clock the castor-oil acted freely, bringing away a highly offensive evacuation. Shortly afterwards smart reaction set in. The face became flushed, the head congested. He muttered unintelligible sounds, looked wildly around, and could not be made to do what he was told, though he apparently understood all that was going on. He kept wanting seemingly to clutch at some person or persons whom he imagined were before him; but he could not use his arms, though he tried to do so. There were no convulsions, but the arms and legs were now quite rigid; and when they were moved remained in any position in which they were placed.

I said that the room presented a disordered appearance. A strange scene indeed it was! Every article of furniture was where it ought not to be; some turned topsy-turvy, others piled one on another; a heavy chest of drawers dragged right across the room and then capsized; the washstand nearly demolished, the different chamber utensils upset, one completely smashed; candle and candlestick knocked to pieces; everything on the toilet-table in wildest confusion,

the looking-glass thrown down on its face; and the whole apartment appeared as if a desperate struggle had taken place.

I now had the room put to rights, and I commenced a diligent search for bottles. I at length found three or four carefully put away in a drawer, and one marked, "To be taken at bedtime when required," from which more than a sixth part was gone. I next looked about for prescriptions, and after some trouble found a bundle neatly tied up in his desk, and on discovering the one to which the bottle answered, found that by some extraordinary mistake he had taken more than a sixth part of a bottle, from which he should only have taken a teaspoonful for a dose, and that he had consequently swallowed $1\frac{1}{2}$ drachm of tincture of stramonium.

I need not narrate the circumstances of his gradual recovery. He kept improving all that day, but wandered in his mind, and *could not articulate*. He took what was given him; became more tractable and gentle; and all the different symptoms gradually disappeared. He could not, however, speak at all intelligibly till the end of the next day, and then continually misplaced words; calling his head his foot, his arm his leg, and misnaming the things he required, though ludicrously unconscious of his perpetual misnomers. All this day too he simply answered when spoken to, but never volunteered any remarks, and was constantly muttering a strange jargon of sentences. It was several days ere he could converse without calling something by a wrong name. This rather strange symptom of aphasia, or loss of power of intelligible speech, was mentioned by Dr. John Ogle in the *Lancet* of Aug. 22, 1868, as the transient effect of opium in a lady who had consulted him, and who always, after taking this drug, "called things by their wrong names." He asked if any of the readers of the *Lancet* had noticed a similar result from opium, or any other remedial agents. I replied in the number for Nov. 28, 1868, and stated the facts as displayed in this case. But there is this difference between his case and mine, that Dr. Ogle's patient was thus affected by *small ordinary* doses of opium, and that she was *conscious of thus misplacing words*: whereas, in my case, the patient did so while recovering from an *extra-ordinary* dose of stramonium, and was *utterly unaware of his continual errors*.

Still, however, in both these cases, the result was evidently some very peculiar modification of vascular action either in the meninges or substance of the brain, with which we are as yet unacquainted; it did not certainly depend on any degeneration of the convolutions of the brain, according to M. Broca's theory.

But to return to the history of my patient.

At my evening visit on the third day he could speak with tolerable distinctness, but thickly, like a person with quinsy, and the throat and tongue were painfully dry, the glands of the mouth not yet fulfilling their natural functions. By the fourth day he was convalescent, but complained of much tingling of the lips and itching of skin. He was now able to relate what had happened up to his going to bed on the night he was threatened with asthma.

He told me that he had taken the dose about one in the morning, as the asthma was getting much worse. He had had this bottle made up for a long time, to be resorted to when the attack seemed likely to be very severe; but that he had never before thought it worth while to open it. He said he felt dizzy and stupid shortly after drinking it, and lay down in his bed about half-past one, thinking he was likely to drop off to sleep directly.

He could never remember anything more till three days afterwards, when he saw me by his bedside (at my evening visit), and that he then began to wonder what was going on, and what had happened in the long interval which he felt sure had elapsed since he went to bed.

My theory of what followed is, that, shortly after he lay down, delirium ensued, during which he got up and moved all the furniture about, supposing he was changing house, or under some such idea; that this delirium increased, and then led him to fancy that he was fighting with some imaginary enemy, at which he knocked about in all directions, dispersing everything right and left, and during which tussle he got the bad blows and scars on both hands. That having demolished this supposed antagonist, he placed his feet against the door to prevent any fresh intruder coming in, and then put his head under the bed for further security. This must have been about half-past four, the last time he

was heard moving. That then the symptoms of collapse gradually came on, increasing till eight, the hour at which he was found. Had he remained another half-hour, I doubt not he would have been dead.

The chief points of interest in this case, I think, are, the long and active delirium which occurred for at least three hours *before* the symptoms of collapse; the *absoluteness of the collapse* when it did come; the almost thorough *closure* of the pupil, not the *dilatation* which is usually observed;* the entire loss of speech for such a long time; and the peculiar and somewhat persistent *aphasia*, after the return of the powers of speech; the complete absence of any memory as to what happened during the three days after, though he *appeared* to be conscious on the second day; but he always affirmed, and constantly repeated the remark, that he had no recollection whatever of anything that took place from the time of his taking the dose, till he noticed me (on the evening of the third day) standing by his bedside. Whatever had been going on was unknown to him, even though he had been answering questions, and doing whatever he was desired to do. He said he should always look upon those three days as “a void in his life; that he had had a three days’ trance.”

One other fact, too, is worthy of notice as a sequel. My patient had no more asthma during the remainder of his stay in Torquay (about seven weeks), nor for at least two months after his return home, when he wrote me to say his enemy had revisited him. But it is a curious fact that he had never before had so long a respite. As a rule, he scarcely ever had more than a fortnight’s interval between his more or less severe attacks. I suppose his system had been so sufficiently saturated with stramonium as to have kept off the usual frequency of his complaint; though I think it doubtful if he or any similar sufferer would wish to try the same dose, as a prophylactic even for a few months’ immunity from asthma.

C. PAGET BLAKE, M.D.

* I think it extremely probable that during his delirium the pupil had been so inordinately dilated, that when the collapse came on it suddenly contracted, by a kind of reaction, after such an exhaustive stretching of its fibres.

XIII. LOSS OF SPEECH FROM THE BITE OF VENOMOUS SNAKES.

I WISH in this paper to call attention to some curious cases of loss of speech, which, notwithstanding all that has been said and written of late years on the subject of aphasia, seem entirely to have escaped notice. The cases to which I refer are those in which loss of speech follows on the bite of venomous snakes. That this occurrence is not an excessively rare one the following instances will show :

CASE I.—In the *Medical Times and Gazette* of May 1863 is the account of a case where the bite of a snake proved fatal in $1\frac{1}{2}$ hours. I extract from the report that part which has reference to speech. “It is remarkable that in this case the eyelids became paralysed early, and later the muscles employed in deglutition. *When he could no longer answer questions, he gave signs of understanding them*, and it was never necessary to shake him or repeat the question.” The respiration was difficult, the lips livid. The patient died in $1\frac{1}{2}$ hours. “The brain was examined after death. The sinuses of the dura mater and the veins on the surface of the brain were gorged with blood. There was little fluid in the ventricles.”

CASE II.—In 1852 the keeper of the serpents at the Zoological Gardens in Regent's Park was bitten on the nose by a cobra di capello. A full account of his case is given in the *Lancet*, October 1852. The man was taken to University College Hospital, and arrived there forty minutes after he had been bitten. “He walked with difficulty from the cab to the ward, and pointed to his throat as the seat of pain. *He could not speak*, had difficulty in standing, and was unable to swallow.” His face was livid, and his respiration imperfect. He rapidly became comatose, and died fifty-five minutes after admission.

Autopsy.—“The general character of all the viscera, lungs, liver, heart, spleen, kidneys, &c., was very intensely-marked congestion ; but the degree was different in the different organs. The spleen, for instance, when cut into looked like a dark clot of blood. The same may be said of the posterior parts of the lungs ; the other viscera were gorged

in a less degree. The brain was, however, far from presenting the same condition as the other organs; for the congestion was not so considerable. The right cavities of the heart were rather distended, but the left somewhat contracted. The spinal marrow was taken out, but it presented no feature of pathological interest, saving that the medullary substance was perhaps softer than usual. The blood was altogether dark, alkaline, fluid, and it emitted a peculiarly sour and sickly smell, quite different from the odour ordinarily known to pervade the dead-house."

CASE III.—A Dutch gunner in the Indies was bitten by a serpent called by the natives Oeloer. Almost immediately he became giddy, fainted, and in ten minutes had lost the power of swallowing. Diluted liquid ammonia put into his mouth flowed out again mixed with saliva. The cervical muscles, and especially those of the larynx and os hyoides, were stiff and tense; respiration was laboured and sighing. *There was total loss of speech, with unimpaired consciousness.* The patient at every question applied his hand to his throat, as if to signify that the part was constricted. The pulse was very slow (59), small, weak. The skin was cold. He died $4\frac{1}{2}$ hours after the receipt of the injury.

Autopsy.—Enormous tumefaction of the whole body from emphysema. *Head*: great distension of the sinus of the dura mater; extraordinary development of the blood-vessels under the arachnoid; no particular change in the cerebral substance; slight increase of serous fluid and *collapse of the choroid plexuses in the ventricles.* The medulla oblongata was greatly congested under the arachnoid, especially between the corpus olivare and corpus restiforme. Its internal texture was perfectly normal; the spinal cavity presented no morbid changes. *Thorax*: great rigidity of all the muscles of the throat and neck, with strong-marked hyperæmia of their tissue, which was uncommonly dark-coloured. Little oedema of the epiglottis, perfect closing of the glottis, the mucous membrane of the larynx and trachea pale and covered with thin mucus."

The above case is quoted by Van der Kolk (*Med. Oblongata*, p. 162, Syd. Society's Translation) from a Dutch publication.

CASE IV.—In the *Lancet* for May 21, 1859, Mr. Weston gave an account of the symptoms produced in himself by the bite of an adder. "I told my wife I wished to get home as quickly as possible; but before we had accomplished half the distance (about $\frac{1}{2}$ mile) the power of locomotion began to fail me. *My speech became thick and inarticulate*, the giddiness increased, &c." Besides this interference with speech, Mr. Weston also found "that to swallow any liquid was impossible."

CASE V.—A native Indian was bitten by a snake of unknown species, and came under the care of Dr. Shortt, who has recorded the case in the *Indian Annals of Med. Science*, vol. iv. Twenty minutes after the man had been bitten "he felt giddy. This was followed by deafness and *inability to speak distinctly*, and he felt his tongue thick and adherent to the roof of his mouth. On attempting to walk he began to

stagger." There was after this dyspnœa and suffusion of the face. The man recovered.

CASE VI.—A soldier in India was bitten by some snake or other. He "answered questions in an indistinct manner, suffered from difficulty in deglutition," and his breathing was laboured. He fell into a state of collapse, and died about ten hours after the accident.

The lungs were found "engorged with blood." The condition of the brain is not described. *Trans. of Med. Soc. of Calcutta*, vol. i. p. 314.

I doubt not that by hunting through medical works I might find other cases of the same kind. I prefer, however, to quote the evidence of an eye-witness of these accidents, whose statement places the frequent occurrence of the symptom in question beyond all dispute.

"I have seen," says M. Russ, "many persons who had lost their speech from being bitten by the *fer-de-lance* snake. This strange symptom is sometimes instantaneous; in other instances it only appears after an interval of several hours. In those who survive the effect of the venom it lasts for an indefinite period. It is altogether independent of the particular situation of the bite. One man I have seen who had not only lost his speech in consequence of this accident, but had become, and still remained, hemiplegic; but in the rest speech alone was abolished. The intelligence was altogether intact. Sensibility and power of motion were unaffected. The persons in question continued to follow their ordinary occupations in silence. One woman who had been thus for a long time condemned to silence, all of a sudden, under the influence of strong excitement, recovered her speech; but when the emotion had passed away, speech again left her. I have never had an opportunity of making a post-mortem examination in one of these cases. I therefore do not know what is the condition of the brain."*

It would appear, then, that loss of speech is no very uncommon consequence of the bite of a venomous snake, and that when it occurs it is one of the earliest symptoms, preceding as a rule the dyspnœa, the lividity of the skin, the general venous congestion, and other results of impeded passage of blood through or into the lungs. It would appear, moreover, to be independent of muscular paralysis, and some-

* Cf. *Bull. de la Soc. Anthropol.* 1861, p. 220.

times to remain permanently, when other symptoms have passed away.

Now how is this curious symptom to be explained? In the first place, I take it to be a fact established beyond all fair dispute that the central organs specially concerned in speech are, in the vast majority of men, located in a limited portion of the left cerebral hemisphere, and that, though the exact boundaries of this region are not yet precisely known, it lies somewhere in near proximity to the fissure of Sylvius, and derives its nourishment from the middle cerebral artery. The arguments in favour of this modified statement of Broca's doctrine I have elsewhere considered at length (see *St. George's Hospital Reports*, vol. ii. "Aphasia and Agraphia"), and will not here repeat.

We have, then, to find some mode in which the venom can act on this part of the brain so as to suspend its functions; can act, moreover, with great rapidity and suddenness, and yet so act as to leave no trace of altered structure in the nerve-substance, should death occur in the course of a few hours. At the same time the action must be such as to be capable of leaving permanent brain-damage in cases which are not immediately fatal. Now all these conditions are satisfied, if we suppose the poison to produce by its passage a sudden and abiding contraction of the middle cerebral arteries. If that were the case, the effect of the poison would be precisely the same, as far as regards the brain, as that of the occlusion of the middle cerebral vessels by plugs of fibrin. It is, I think, impossible to read the cases I have given without being struck with the resemblance of the symptoms to those produced by such embolism. The giddiness, the sudden loss or alteration of speech, with unimpaired consciousness, the difficulty of deglutition, are all repeated. The first argument, then, in favour of this hypothetical interpretation is, that it is sufficient to account for the symptoms. A second argument in corroboration of this is furnished by the post-mortem appearances. Unfortunately the state of the brain is only described at all carefully in two of the cases. In both of these the description is consistent with my hypothesis. In the one (Case II.) the brain was anæmic, and this anæmia was the more striking because the other viscera were in a remark-

able state of congestion. In the other instance (Case III.) the post-mortem evidence is more conclusive. The curious detail is given that “*the choroid plexuses in the ventricles were in a state of collapse.*” But these plexuses receive a large proportion of their blood from the choroid arteries, which are given off either from the middle cerebral arteries themselves, or from the internal carotids of which the middle cerebral are offshoots; so that the collapse of the plexuses points directly to some obstruction, such as would be produced by complete contraction of the middle cerebral vessels, or of the internal carotids. I do not indeed see what other explanation of the collapse can be given.

Such an arterial contraction as I am supposing would of course produce no visible alteration in the brain-substance in the course of a few hours. Atrophic softening requires for its production a considerable space of time. It cannot therefore be a matter of surprise that in the above cases no lesion of the brain was noticed after death.

In the cases, however, described by M. Russ, where the aphasia was permanent, we must suppose either that the arterial contraction continued long enough to produce irremediable damage in the brain-substance; or, more probably, that it continued for a considerable space of time; and that during that time a coagulum was formed at the point where the blood was arrested, and that thus the temporary obstruction of the blood-current was made a permanent one.* Such a supposition is not, I think, a strained one; as it is well known that nothing is so prone to cause coagulation in a vessel as the stagnation of the blood within it. Complete closure of an artery by contraction would of course be practically equivalent to its closure by a ligature; and it is a fact familiar to all, that when an artery is tied, a coagulum forms above the ligature with very great rapidity.

It may be asked, is the suggested action of the venom upon the middle cerebral arteries supported by analogy? Is there any other instance known, in which a substance mixed with the blood singles out some one artery or set of arteries,

* The thrombosis of the pulmonary artery, which occurs not rarely in cholera, may be explained in a like manner. The cholera-poison produces spasm of the branches of the artery, and the stagnant blood coagulates on the heart-side of the obstruction.

and causes it to contract, while it leaves the rest either entirely or comparatively unaffected? There is. In the first place, we have the well-known experiments of Mr. Blake. From these it is plain that the salts of potash when injected into the blood cause contraction in the systemic arteries, though they pass through the pulmonary vessels without any similar effect. On the other hand, the salts of soda cause contraction in the pulmonary artery, while they exercise a comparatively feeble action upon the systemic vessels. (Cf. *Edinburgh Med. and Surg. Journ.* liv. pp. 341, 346.) As a second instance, we have the cholera-poison. Dr. George Johnson has shown that there are, to say the least, very strong reasons for believing that this substance acts upon the pulmonary artery in the same way as do the salts of soda; that is, that it produces in this vessel and its branches a spasmodic contraction, while it passes through the other arteries without any such effects. (Cf. *Med. Chir. Trans.* L. p. 103.)

The salts of soda and of potash and the poison of cholera furnish us, then, with analogous cases. Alcohol, I think, supplies another. When a considerable dose of this fluid has been absorbed, the skin generally, but notably the skin of the face, becomes redder and warmer; and it is the sensation of skin-warmth which leads persons to the erroneous notion that they can warm themselves when cold with alcoholic drinks. In reality, at the same time as the skin becomes warmer, the internal organs become colder, and a thermometer placed under the tongue readily reveals the fall of temperature.* The simplest explanation of these phenomena is that the alcohol causes contraction in the arteries of the internal organs—if not of all, yet of some—and that the redness and increased warmth of the skin are due to the fact that the skin-vessels are not made to contract, and consequently are dilated by the warm blood driven into them by the closure of the other vessels.†

* For experiments showing that alcohol causes a fall in the internal temperature, see my paper on "The Diurnal Variations in the Temperature of the Human Body in Health," in the first volume of these *Reports*, p. 235.

† It is immaterial for my present purpose whether alcohol cause contraction of certain internal arteries, or paralysis and consequently dilatation of external arteries. In either case the result will be the same—accumulation of warm blood in the skin-vessels, anæmia of certain internal organs.

It is, I think, very probable that the therapeutic effects of many drugs depend upon their exercising a similar selective influence, on their producing, that is, contraction, either exclusively or preferentially, in some limited set of arteries. We may, for instance, with great probability, thus explain the valuable action of digitalis—first discovered by Dr. Dickinson*—in staying menorrhagia, and the similar action of ergot of rye. We have only to suppose that these drugs produce spasm in the uterine vessels, and their action becomes readily intelligible.

I am aware that the operation of these drugs may be explained in another way. It may be supposed—and this supposition is adopted by Trousseau†—that they check menorrhagia by causing contraction of the uterus itself, and thus compressing the vessels externally, and obliterating their channels. The contraction of the uterus, according to this view, precedes and produces the vascular obstruction. This may, of course, be so. But it is at any rate equally possible, and, I think, very much more probable, that the order of events is the reverse of this; that the drug first causes arterial spasm, and that the contraction of the uterus is determined by the anæmia thus produced. There are good grounds for believing that anything which deprives the uterus of arterial blood will cause that muscular organ to contract. Thus Brown-Séquard found that when venous blood was injected into the uterine vessels of a rabbit, contraction was at once produced, and that this contraction immediately gave way to relaxation when arterial blood was passed into the vessels. Brown-Séquard, it is true, attributed the contraction of the uterus in this experiment to the stimulating qualities of the carbonic acid, and not to the absence of arterial blood. But Dr. Radcliffe has shown good reason for supposing that this is an error, and “that the influence of venous blood in the process of muscular motion is equivalent

I also pass over, as beside my present purpose, the question whether alcohol causes a temporary diminution in the production of heat—as, indeed, I think it probably does. This might account for the fall of temperature in the internal organs, but not for the rise of temperature in the skin. There is clearly an alteration in the *distribution* of heat, and not merely an alteration in the amount produced.

* *Med.-Chir. Trans.* 1855

† *Traité de Thérap.* i. 799.

to the absence of the influence of arterial blood, and to no more than this.”*

The explanation, then, which I would give of the action of digitalis and ergot of rye in menorrhagia is, that they first cause spasm of the uterine vessels, and that the consequent deficiency of arterial blood leads to contraction in the uterus itself. This explanation appears to me more probable than the second I have mentioned for several reasons, and, among others, because of the known action of ergot, when taken for a long time or in very large doses, on other parts than the uterus. It has been found to cause gangrene in the hands and feet, and even sometimes in the whole of a limb; and this gangrene, according to all appearances, results from the obliteration of the arteries of the part.† So also Brown-Séquard, after administering large doses of this drug to dogs, saw the vessels in the pia mater become contracted (*Lancet*, Aug. 18, 1860). Still more recently this drug has been found to cause contraction in the vessels of the iris; and again, when taken for a length of time, as is not rarely the case with those who live on rye-bread, to stop the secretion of milk—an effect which may fairly be attributed to contraction of the mammary vessels. All these results, however, appear to require for their production much larger doses, or much longer use of the drug, than suffices to produce the effect on the uterus; and thus the drug may be said to act preferentially on the vessels of this organ, though it also exercises after a time a similar influence over the vessels of other organs.

Another drug which causes contraction of arteries, and of some arteries in preference to others, is belladonna. It is a familiar fact that small doses of this poison produce marked dilatation of the pupil; and there are very good reasons for believing that this dilatation of the pupil is chiefly, if not entirely, due to contraction of the vessels of the iris.‡ The

* *Lectures on Epilepsy, Pain, &c.* p. 90. 1864.

† Trousseau and Pidoux, *Tr. de Thérap.* i. 791. If the arteries are really obliterated, then we have another instance, besides those already mentioned, of thrombosis caused by the spasmodic contraction of blood-vessels, and consequent stagnation of blood.

‡ Cf. Dr. Radcliffe, *Lect. on Epilepsy, &c.* 1864, p. 242, and Brown-Séquard in *Lancet*, Aug. 18, 1860.

action of belladonna when given in *small* quantities seems frequently to be entirely confined to these vessels; at any rate, it clearly exercises a preferential influence upon them. But when administered in *large* doses, its action extends to other arteries than those of the iris. Thus Brown-Séquard* saw a diminution in the calibre of the vessels of the pia mater take place in dogs after large doses of belladonna, as also after large doses of ergot. Its action, again, as that of ergot, may extend to the blood-vessels of the mammæ, and, by causing contraction in them, put a stop on the flow of milk.

The action of quinine in ague also admits of a partial explanation on the same principle. What the exact connection may be between an ague-fit and an enlarged spleen is not known, but their coexistence is a familiar fact. Now a large dose of quinine which arrests an ague-fit also produces a most rapid—sometimes almost an instantaneous—decrease in the bulk of the spleen. This decrease is so great, that it may be recognised without difficulty by percussion within an hour of the administration of the drug, or even sooner than this. The arteries of the spleen are more muscular than those of any other organ, and the decrease in the bulk of the organ is almost certainly due to a spasmodic contraction produced in them by the quinine.

The results, then, at which I arrive are these :

- α. The bite of a venomous snake frequently causes loss of speech.
- β. This symptom, when it occurs, is an early one, preceding paralysis, and the results of impeded transit of blood through the lungs. It may last for an indefinite period, when other symptoms have disappeared.
- γ. The symptom may be rationally accounted for by supposing that the poison produces spasm in the middle cerebral arteries.
- δ. When the symptom is permanent, its continuance is probably due to thrombosis of the arteries above the temporary constriction.

* Cf. loc. cit. above.

- ε. That the poison should thus act preferentially on a single artery or set of arteries is consistent with the observed action of other poisons and drugs—notably with that of cholera-poison, of alcohol, quinine, digitalis, ergot of rye, belladonna, soda and potash salts.

WILLIAM OGLE, M.D.

XIV. UPON CERTAIN MORBID CONDITIONS OF THE APPENDAGES OF THE LIVER.*

A PATHOLOGICAL LECTURE.

MANY of you may have noticed from time to time how slight the symptoms are of which patients complain who are admitted into the Hospital with what proves to be a grave, or even dangerous, malady; and also the very insidious manner in which disease often makes its approach. This is partly attributable, no doubt, to the slowness of the morbid action, partly to the want of sensibility of the affected parts.†

Taking examples from the organs of digestion, how very often may cancer of the stomach, for instance, exist for a lengthy period, and yet give rise to but little derangement of the function of the organ: frequently the tongue remains clean even when the disease has arrived at an advanced stage. Very serious organic change in the stomach or liver may exist, and yet the only symptom noticed by the patient may have been some degree of tension and uneasiness, not amounting to pain, in the region of the epigastrium after food; vague colicky and other sensations; occasional nausea and loss of appetite, and eructation. How often, again, may peritonitis make progress with symptoms referable only to dyspepsia. Having myself been especially impressed by the slowness and obscurity of the symptoms in one or two cases of serious

* The numbers added at the end of several of the cases quoted refer to the folios in our Hospital Post-mortem Books.

† That different symptoms may be produced according as different parts of the same organ are affected, is illustrated by the fact that vomiting is found to arise from galvanism of the cardiac portion of the mucous membrane of the stomach, whereas pain only is produced if the pylorus and fundus are galvanised.

disease of the liver and its appendages, the consideration of this fact, and the description of the somewhat unwonted appearances met with in the post-mortem of a well-known member of our own profession (Dr. Kennion), as lately recorded in some of the medical journals,* suggested the following inquiries and observations respecting certain morbid states of the gall-bladder and bile-ducts. On reference to the case to which I have just alluded, you will find that it began with symptoms of slight pneumonia, along with those of slight peritonitis in the neighbourhood of the liver. Subsequently the symptoms were such as to be referred to the ileocaecal region. Eventually collapse suddenly set in.

On *post-mortem examination*, in addition to other lesions, ulcerative communication between the gall-bladder and the colon were met with. This was attributed to slow ulceration, commencing in the gall-bladder. Immediately before death, perforation into the peritoneal cavity had occurred, producing collapse; and this, had the patient lived longer, would doubtless have caused general peritonitis. Whether the morbid condition of the gall-bladder and colon originated in irritation caused by the presence of gall-stones within the gall-bladder, or otherwise, is uncertain. At any rate, it appears that no gall-stone was met with in the course of the examination.

By the cases which I now in the first place bring before your notice, it will be seen that ulceration of the gall-bladder and biliary ducts, with or without disease of the bowel and other neighbouring parts, and especially that one form of biliary fistula, viz. ulcerative communication between the gall-bladder and the intestine (the result of cholecystitis), is illustrated. Other morbid conditions also of the hepatic appendages I shall bring before your notice at a later period of my lecture.

Cholecystitis is certainly not to be considered a common affection; but when it does exist, it is, according to my experience, most frequently caused by inspissated gall or biliary calculi retained within its cavity. I am not now speaking of the mere thickening of the parietes of the gall-bladder so frequently met with in some cases, a condition often found where gall-stones have existed in the bladder, and especially

* See, for example, the *Lancet* for July 18 last, p. 73.

where some obstruction to the exit of the bile has been produced. To this I shall refer subsequently.

The following five cases are well-marked instances of cholecystitis, and also of its co-existence, and apparent connection, with gall-stones.

CASE I. *Gall-bladder divided into two cavities, of which one contained a gall-stone, and communicated with the duodenum. Ulceration of the jejunum.*

Hannah A., æt. 42, was admitted into St. George's Hospital Nov. 12th, 1846, with jaundice and bronchitis, having often passed gall-stones.

In the right hypochondrium two or three circumscribed tumours could be felt, apparently connected with the liver, and during her stay in hospital she often had hæmoptysis. Under treatment she greatly improved, and was discharged as out-patient March 10th; the tumours, however, being still felt. On the 21st of April she was re-admitted, with much dyspnoea, bronchitis, and hæmoptysis, and with so much tympanitis that it could not be ascertained whether the tumours existed or not. She was again made out-patient; but on the 19th of June she was once more brought to the hospital, and in almost a dying state, having been seized with acute pain in the abdomen and hæmatemesis. In spite of treatment she sank, and died on the 21st.

Post-mortem examination. The lungs were found congested, and the heart rather softened. The peritoneal cavity contained several ounces of fluid blood smeared over the viscera. The duodenum, about two inches from its commencement, was closely adherent to, and consequently drawn up to the under surface of the liver in the situation of the gall-bladder. On endeavouring to separate the connection, it was found impossible to do so without cutting through the coats of the bowel; and apparently there existed at this time, and had been set up within a very short period of death, a communication between the gall-bladder and the bowel. The gall-bladder itself was *divided into two distinct cavities*: the lower one being small, and only containing thin, opaque, whitish-coloured fluid; the upper one being larger, irregular in its interior, and containing a gall-stone of about the size of a large marble. With this latter cavity it was that the communication with the bowel had existed. The cystic duct was apparently obliterated, and though careful examination was made, the common duct could not be traced. The liver was large, and loaded with bile; and all its ducts much dilated and filled with dark-green bile. On the inner surface of the duodenum, corresponding to the portion externally attached to the gall-bladder, was a small ulcerated spot, at one part of which a probe could be passed through all the coats of the bowel, and apparently the point where a communication existed with the gall-bladder. A portion of the jejunum, of about eight inches in length, was covered with blood extravasated into the subserous tissues covering it and thickening its walls; and corresponding to this portion of the bowels were several irregular ulcerations, with elevated and

everted edges, of the mucous membrane. The stomach and bowels contained much fluid blood. The other viscera were healthy. [138.]

CASE II. *Gall-bladder containing a gall-stone, and communicating by ulceration with the duodenum, which was extensively ulcerated.*

Elizabeth T., æt. 30, was admitted into St. George's Hospital Feb. 23d, 1848, with pyrosis and other dyspeptic symptoms of some standing, and vomiting, and in a state of salivation from medicine. She had also excessive and painful contraction of the flexor muscles of the hands and feet, which were then rendered quite useless, and she had lost much flesh. The catamenia had appeared the previous week the first time for eight months. No tumour or hardness of the abdomen could be felt, but lumpy evacuations were removed by purging, *after which the painful contractions of the extremities* quite ceased. The stomach-symptoms then remained. After a time they partially subsided, but decided peritonitis came on (the salivation continuing), and she sank, and died March 9th.

After death, it was found that pleuro-pneumonia and empyema had occurred; and, in addition to peritonitis both recent and of older date, the following conditions were met with. The pyloric end of the stomach was tucked-up under the liver, and firm old adhesions were found to exist between the commencement of the duodenum and the gall-bladder, and the immediately-surrounding parts. The stomach was rather distended and large; its coats thicker than natural, and its rugæ very prominent and uneven. Its mucous lining was darkish and hypertrophied. Immediately beyond the pyloric end of the stomach, a considerable ulceration of the mucous membrane was found, existing in the form of several distinct ulcers communicating with each other beneath the serous membrane; and in the burrowing ulcer thus formed a gall-stone of about the size of a Spanish nut was found. From this ulceration a small ulcerated opening led into the gall-bladder, which was much contracted, with its walls very thickened. The gall-bladder contained a small gall-stone, and some thin whitish fluid. The kidneys were large, coarse, congested, and mottled.* [47.]

CASE III. *Perforation, by ulceration, of the gall-bladder, which contained gall-stones. Ulceration of the duodenum and transverse colon.*

Mark P., æt. 64, was admitted into St. George's Hospital Nov. 24th, 1858, in a state of great prostration following an attack of gall-stones, with pain on pressure upon the right hypochondriac region, and also with a carbuncle at the angle of the right side of the jaw. It was stated that he had had jaundice in 1851, and been subject to bilious attacks since he was 40 years of age. In these attacks he was often delirious, and often lost a quantity of blood by the bowels. The carbuncle was opened;

* In the *Transactions of the Pathological Society*, vol. viii. p. 235, you will see a case of impaction of a large biliary calculus in a cul-de-sac of the duodenum, which had found its way out of the gall-bladder by ulceration, described by Dr. Harley.

but subsequently erysipelas set in, followed by low delirium, and he sank, and died December 12th.

Post-mortem examination. The various other important organs were found to be healthy, but the abdominal viscera were matted together by adhesions. The gall-bladder was full of gall-stones, and numerous perforations of the gall-bladder had taken place. There was an abscess communicating with these perforations, lying between the liver and the hepatic flexure of the colon, and filled with pus of an intense yellow colour. The common bile-duct was, however, quite pervious. The duodenum was very thickened, and presented a deep ulcer close to its commencement at the pylorus. Another similar ulcer was found at the commencement of the transverse colon; and the intestine was congested in patches at other parts. No cause was found for these ulcerations. [295.]

CASE IV. *Ulceration of the inner surface of the gall-bladder, which was full of clotted blood. Ulceration of the cystic duct.*

Eliza W., æt. 40, was admitted into the Hospital Jan. 1st, 1851, with pain in the hypochondriac region, anasarca, and pain in the loins. She had never had jaundice. Later on, a small, soft, movable tumour was felt just below the edge of the liver, painful on pressure. Various symptoms, including difficulty of breathing, came on, and she died January 31st.

Post-mortem examination. I found that the kidneys were much diseased, and the heart was large, and the pericardium covered with recent lymph. The liver was very firm and nutmeggy. The gall-bladder was distended by a large dark semi-fluid clot of blood, and its coats were hard and much thickened. The lining membrane had quite lost its rugous character, and at the anterior part, about two inches from the fundus, it was ulcerated to the extent of about a shilling; at the lower parts the mucous membrane was much injected. The cystic duct was much contracted, and at its opening into the gall-bladder was connected with a species of cavity extending upwards about an inch under the mucous membrane, as if from ulceration. No calculus was found in the gall-bladder or ducts. [213.]

In this case we have ulceration, whether from gall-stones or not, proceeding, as an unusual result, to extravasation of blood into the cavity of the gall-bladder. The cystic duct was also ulcerated, and this was almost certainly from arrest of a calculus, although (as in the case of Dr. Kennion) none was found in the examination.

CASE V. *Ulceration of the gall-bladder, in which were numerous gall-stones. Abscess in connection therewith, and communication with the duodenum and common bile-duct.*

The patient, William S., was an out-patient at the Hospital in 1852, with jaundiced skin. While one day in the waiting-room, he had a

desire to empty the bowels, and whilst at the water-closet he died suddenly.

Post-mortem examination. I found hepatisation of the lungs, and much serous exudation in the pericardium, the heart's cavities being dilated and having thickened walls. An abscess of the right lobe of the liver, with offensive, dark-coloured contents, and holding a large number of variously-sized biliary excretions agglomerated together, forming a mass of the size of a hen's egg, *i. e.* of the size and shape of the gall-bladder, existed. The duodenum and colon were adherent to the liver, and the former formed part of the walls of the abscess. Moreover, two corroded and ulcerated openings existed between the abscess and the interior of the duodenum, and a similar one between the abscess and the interior of the common bile-duct. The liver generally was very fatty, and the kidneys much diseased. It seemed that ulceration had begun in the parietes of the gall-bladder, which was distended with gall-stones; its walls had become destroyed, and the neighbouring portion of liver implicated, the formation of abscess resulting.

As this case was recorded by myself, with all details, in the *Transactions of the Pathological Society* (see vol. v. p. 161), I have only here given a sketch of it.*

The above five cases are not only well-marked examples of cholecystitis, but of this affection proceeding to ulceration of the walls of the gall-bladder, and in some of the cases to communication between this cavity and the contiguous duodenum. There is also ample proof of more extensive inflammation having existed than that afforded by the gall-bladder, in the fact of the existence of obliteration of the cystic duct, and of neighbouring adhesions of old standing (case No. i.); of thickening of the walls of the gall-bladder, and burrowing ulcer (case No. ii.); and of abscess (case No. iii.).

In each case but the last, one or more gall-stones were found in the cavity of the gall-bladder; and it is more than probable, I think, that it was to the presence of these calculi that the inflammation of its walls was due. Still, a reasonable doubt on this point may be entertained, partly from what we know generally of the formation of hardened bile and gall-stones secondary to, and consequent upon catarrh and other morbid states of the lining-membrane of the biliary passages and gall-bladder; and partly from the existence in two of the above cases of ulceration and perforation of other parts of the bowel than that which directly communicates with the diseased gall-bladder. Thus in case No. i. we have in addi-

* The preparation is preserved in our Museum: see Series ix. No. 292.

tion, ulcer of the jejunum ; and in case No. III. ulceration of the duodenum below the perforated portion communicating with the gall-bladder, and also ulceration of the transverse colon. (The burrowing ulcer in case II. was most likely owing to extension from the primary point of perforation ; and the abscess in case III. between the liver and the hepatic flexure of the colon originated in the same manner.)

CASE VI. *Ulceration of the common bile-duct. Abscesses in the liver. Occupation of the portal vein by pus and broken-down blood-clot. Gall-stones in gall-bladder.*

Louisa H., æt. 44, admitted November 6th, 1866, and died on the 24th, with abscesses in the liver, and pus with broken-down clot in the portal vein. She had been subject to jaundice and to the passage of gall-stones. In addition to the state of the liver before mentioned, the hepatic duct and ductus communis choledochus were dilated, and at the juncture of the common duct with the duodenum the mucous membrane of the duct was ulcerated throughout its whole circumference for the extent of half an inch. The gall-bladder contained several gall-stones.* [317.]

The last case illustrates, as the previous five cases did, ulceration of the bile-passages ; but it is the bile-DUCTS and not the reservoir or bladder which is affected. Here, again, we have the presence of gall-stones, complicating and possibly causing it. We have gall-stones in the bladder, and most probably arrest of some calculus may have caused the ulceration of the common bile-duct which existed. At any rate there had been obstruction, at some time or other, judging from the dilated state of the ducts. This case also exhibited the formation of pus in the portal vein, and abscesses in the substance of the liver which may have been truly parenchymatous and of the nature of so-called secondary purulent deposits, or may have been merely collections of pus in the biliary passages, the results of catarrh. Such collections of pus in the bronchial tubes of the lungs when divided are often mistaken for genuine parenchymatous abscesses.† As I before remarked, I believe, from what I have found in post-mortem examinations, and from the experience of others, that the most common cause of inflam-

* I should here have given you the particulars of an interesting case of obstruction of the cystic and hepatic ducts, producing enormous distension of the biliary ducts, throughout the liver, and the appearance of cysts on the surface of the liver below the peritoneum, had it not been related with all details by my colleague Mr. Holmes in the eleventh volume of the *Pathological Society's Transactions* (see p. 130), and illustrated by a plate.

† Rokitsansky (see vol. ii. p. 158, Sydenham Society's translation) speaks

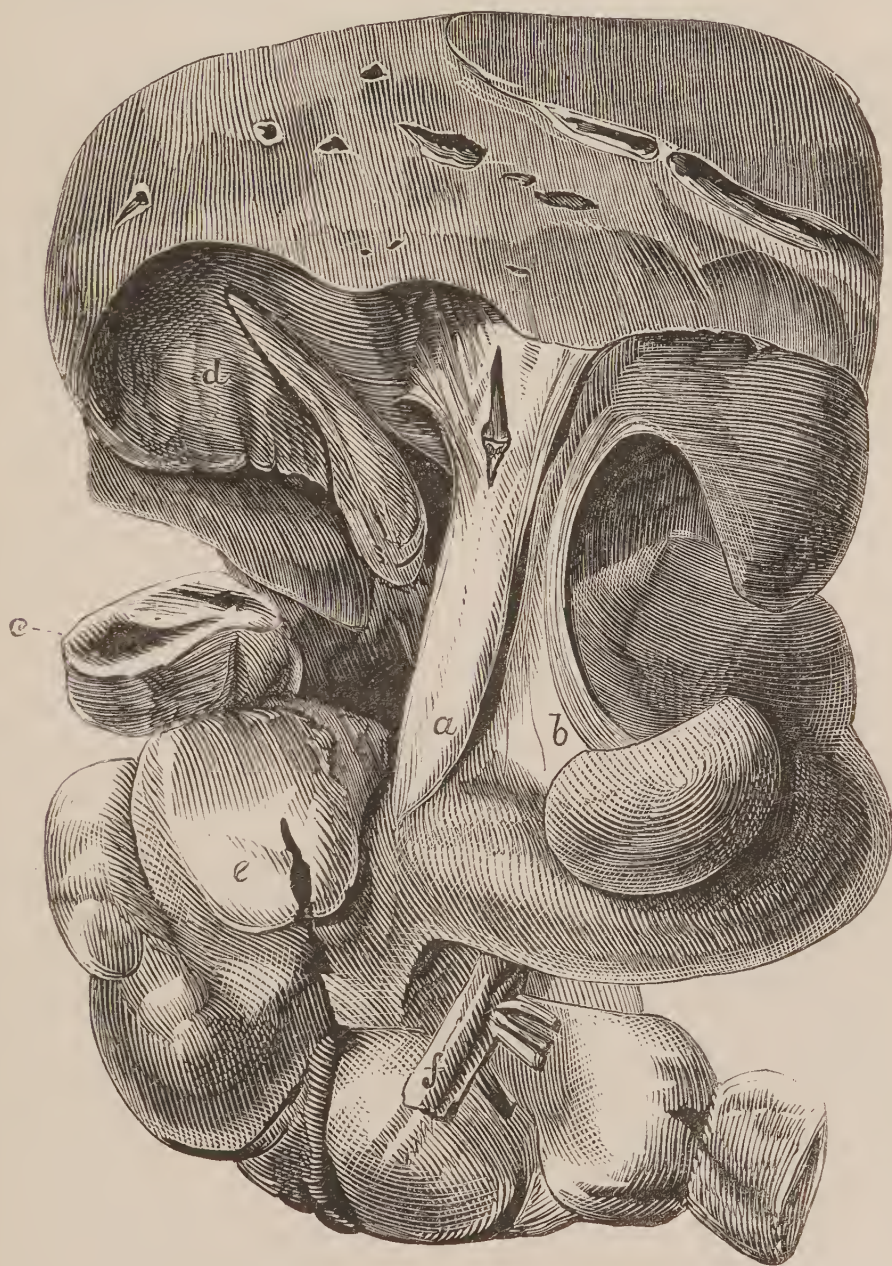
mation of the gall-bladder and bile-passages is the presence of gall-stones.* Biliary calculi are of light specific gravity, and would float on the surface of the bile; and some have seemed to suppose that consequently they would be comparatively unlikely to produce inflammation; still, even if this followed, they are frequently angular, and if of very large size or if multiplied, or crowded into a gall-bladder whose walls close tightly upon them, or if one or more become wedged in the ducts, the cystic or the common ducts or the general bile-canals, they will be very likely to set up inflammation of the walls of the gall-bladder or passages. I have repeatedly examined gall-bladders which contained such gall-stones, and which were not ulcerated or even inflamed, but in which indentations of the lining-surface of the bladder had been produced, and also obliteration of the rugæ and areolæ natural to the mucous membrane. This indicates that pressure of biliary calculi will speedily affect the inner surface; and in corroboration of this I may direct you to the museum of the Royal College of Surgeons, where you will find several specimens of gall-bladder containing calculi, in which marks or indentations of the latter are quite conspicuous upon the gall-bladder (see Series xxix. § 3).

Still, it may be that inflammation and ulceration of the inner surfaces of the gall-bladder and biliary passages may proceed not from any mechanical cause acting within them, but from some condition of the bile which flows over them. Some have thought that when obstruction to the outlet of bile occurs, it may, owing to stagnation, become altered in character, and this in a manner to irritate the membrane which it bathes. Such obstruction may arise from bands across the calibre of the ducts; or from pressure from with-

of abscesses of the liver from distension of the bile-ducts with pus, the canals themselves not being easily discoverable, even by the aid of injections. He also speaks (p. 159) of saccular dilatations of the gall-ducts from catarrh, in some cases suppuration, and even perforation of their walls, following.

* Possibly in some cases perforation of the gall-bladder may arise from softening of post-mortem origin. Thus in our Post-mortem Book for 1862, you will find related the case of a patient—Henry W. æt. 37, who was admitted May 30th, and died June 14th with collapse from rupture of a kidney—in whom was found after death softening of the walls of the gall-bladder, which was nearly perforated, so that bile oozed through it. This was thought by Dr. Dickinson, who made the post-mortem examination, to be probably owing to a post-mortem change.

out, as from diseased pancreas, or from morbid lymphatic glandular growths. Of this latter cause of obstruction the accompanying figure of a specimen which I dissected and put up in the Museum, and which was removed from the body by Mr. Holl, who preceded me as Pathological Curator, presents a good illustration.*



Section of the liver showing the common bile-duct, *a* (into which an incision has been made), greatly distended, owing to pressure exercised at its lower extremity by, *e*, a mass of enlarged glands; *b* indicates the shrunken hepatic vein; *d*, the emptied gall-bladder; *c*, the divided and ligatured duodenum; and *f*, the superior mesenteric vessels emerging from beneath the pancreas.

* Frerichs, in his treatise on *Diseases of the Liver*, gives several illustrations of dilatation of the ducts from pressure of tumours. (See Sydenham Soc. translation, vol. i.)

Growths even of the substance of the liver* may produce such obstruction. I will incidentally remark that we find dilatation existing to a great extent in some cases, even where no obstruction to the exit of bile exists, or apparently has ever existed. Andral mentions an interesting case in which the choleduct canal was at least three times larger than it should be, and yet it opened freely into the duodenum. It may, I think, have been originally that a gall-stone had stopped the way. Or obstruction may of course be owing to a biliary calculus (most commonly so), or to entozoa, hydatids, &c.;† or merely to a concentrated and thickened and so-called inspissated bile (of which numerous instances from our Museum are on the table); or it might be from thickening or stricture‡ of the mucous membrane, or of the entire thickness of the walls with or without tumours;§ or from closure or obliteration of the ducts or of their outlets into the duodenum, as by the pressure of an in-

* Dr. Bristowe, for example, in the *Path. Soc. Trans.* vol. ix. p. 222, describes a case of the portal vein being displaced by a tumour of the liver, and at p. 293 a hydatid abscess of the liver producing pressure upon a hepatic duct within the substance of the liver.

† In our Museum you will find a specimen (Series ix. No. 321) in which the common bile-duct is filled with a hydatid cyst which had passed into it from the hepatic duct. Connected with the right hepatic duct also is a cyst of the size of a tennis-ball, which originally was full of hydatids. The case was brought before the notice of the Pathological Society (see *Trans.* vol. xiii. p. 104) by Dr. Dickinson.

I have a note of a case related by Dr. Morehead, in his *Clinical Researches on the Diseases of India*, vol. i. p. 163, of obstruction of the hepatic duct by a lumbricus. Lobstein, in his *Pathological Anatomy*, describes and figures a gall-stone having the ascaris as a nucleus (quoted by Thudichum in his *Treatise on Gall-stones*, p. 65). Buisson also found a liver-fluke as the nucleus of a gall-stone in an ox. I might bring before your notice several cases from various authors of hydatids of the liver finding their way into the biliary ducts, sometimes into the bowels, in other cases being arrested in their course. Dr. Murchison related to the Pathological Society (see vol. xvi. p. 160) a case of hydatids of the liver bursting into the duct. Spontaneous cure was going on, when death was caused by peritonitis, owing to rupture of adhesions between the diaphragm and the wall of the hydatid cavity. A few cysts remained in the cavity, and their occasional passage along the bile-ducts gave rise to attacks of pain like that produced by a gall-stone. It may be interesting to notice that round worms have several times been found in the bile-ducts, in some cases producing jaundice.

‡ A case of stricture (exactly resembling a urethral stricture) of the hepatic duct and dilatation is related by Dr. Bristowe in the *Trans. of the Path. Soc.* vol. ix. p. 221.

§ Dr. Bristowe describes also, in the volume quoted in the above note, a case of tumour in the walls of a hepatic duct causing obstruction.

tussusception, as mentioned by Frerichs; or by an aneurysm of the hepatic artery, as mentioned by Stokes in his lectures quoted on the following page;* or again, over-distension,† even by healthy bile, may be imagined capable of causing

* Regarding the closure of the bile-passages by thickening of their walls in connection with catarrh of the intestine, see a paper by Hoffman in Virchow's *Archiv* for June 1867.

† The gall-bladder and ducts are no doubt capable of great distension; this often is rapidly produced. Gall-stones of very large size have been known to pass by the bowels or to be vomited from the stomach, and this in cases where no ulceration of ducts during life has been indicated. Again, the ducts have been found distended after death, by reason of obstruction to the outlet of bile, to a very considerable extent. The common duct and the cystic duct are described, in cases which I could quote, of the diameter of the thumb, or again of the small intestine. Dr. Alexander Monro, in his observations on *Spasm of the Canals*, &c. (1826, p. 28), says that his father tied a ligature around the common bile-duct of a living sow, and the duct, in the space of A FEW DAYS, became ten times at least larger than in the sound state. In the ninth volume of the *Transactions of the Pathological Society*, p. 230, you will find related by Dr. V. der Byl the case of a patient in whom after death the gall-bladder was found to measure $7\frac{1}{2}$ inches, and to contain 15 oz. of pale muddy fluid resembling barley-water. The common bile-duct, being obstructed by a cancerous mass growing from its inner surface, was pressed upon by a cancerous growth at the head of the pancreas, quite unconnected with the cancer of the duct. Dr. Babington, in the *Guy's Hospital Reports* (see vol. vii. 1842-3), relates a case in which the gall-bladder contained three washhand-basins of bile. In the *Philosophical Transactions* for 1738 is related by Mr. Amyaud the case of a man whose gall-bladder was so distended that it held at least three pints after death. In connection with this was a superficial abscess, which was opened, and from the wound there discharged eighteen quarts of bilious matter in twenty-five days. The surface was rugged and unequal, and its coats thick and horny. The liver was natural, but the cystic duct was so compressed by the bag of the gall-bladder, that nothing could pass through it. In the wall of the gall-bladder was a quantity of cretaceous matter "intermixed with hard stones." Most likely these were biliary calculi, which had blocked up the outlet of the bile. Dr. A. Flint related to the Pathological Society of New York a case of enlarged gall-bladder producing a large painful tumour below the ribs, caused by occlusion of the cystic duct (see *New-York Medical Journal*, Sept. 1865, p. 461), no cause for this being found. Andral (op. cit. p. 559) relates the case of a man who had a large, mobile, pyriform tumour beneath the ribs, supposed to be a distended gall-bladder, which entirely went away under treatment; and Dr. Pitman, one of our consulting-physicians, has recently told me of a similar case which came under his own eye. Dr. Thudichum (op. cit. p. 204) quotes a case of Dr. Gibson's in the *Med. Essays and Obs.* (ii. obs. 30),—the case of a boy who had a large swelling in the abdomen, which began in the right side, stretched over to the left hypochondrium, raising the under part of the sternum, and forcing outwards the false ribs of both sides. This was tapped, and near three Scots pints of water of a greenish colour drawn off. He died two days afterwards, and the distended gall-bladder was found to contain eight pints of bile. Cruveilhier, again (*Traité d'Anatomie Pathologique*, tom. ii. p. 832), speaks of a gall-bladder being as large as a urinary bladder, owing to slight pressure from cancerous lymphatic glands upon the choleduct canal. Such distended

irritation and inflammation.* Or the bile itself may be supposed to be secreted in a noxious condition, owing to which irritation is caused by it; as for example, in those rare cases of typhoid or other forms of fever, wherein ulceration of the gall-bladder or bile-passages is encountered after death. This appears to have been Dr. Budd's supposition, fortified by the occurrence of cases of ulcer of the duodenum around the outlet of the common bile-duct along with ulcer of the gall-bladder and common bile-duct, no gall-stone existing.† (I may here notice that in my case, No. 1. p. 179,

gall-bladders may also in some cases tend to "point externally," and thus simulate abscess. I need hardly tell you these cases are of the greatest rarity. Dr. Stokes, in his lectures on the *Theory and Practice of Medicine*, refers to such a case, which was punctured. Copland, again, in his work on the *Practice of Medicine*, alludes to a case of gall-bladder so distended as to protrude the false ribs of both sides, and containing eight pints of thick bile,—though he does not give the exact reference. This distension appears in some cases merely dependent upon a want of contractility of the walls of the bladder, existing along with so-called torpidity of the liver, stomach, and duodenum. Frerichs quotes from several authors cases of greatly distended gall-bladder, and mentions a case of his own which was tapped, 10 oz. of bile escaping.

* Atrophy of the liver has been attributed, as by Cruveilhier, to distension of the gall-ducts, the dilatation preventing the secretion of bile, and this in its turn leading to atrophy of texture. In connection with this subject, you will read with interest a paper by Dr. Bristowe in the ninth volume of the *Pathological Society's Transactions*, p. 218, wherein, after speaking of thickening, and more rarely thinning, of the walls of the bile-ducts as a result of their obstruction, he adduces several cases showing that a tendency to ultimate destruction of the cells of the liver also results. A case illustrating this will also be found related by Mr. Hicks in the fifteenth volume of the *Path. Soc. Trans.* p. 126. It was that of a woman who died having the cystic duct and part of the common duct occupied by a large gall-stone, which also projected into the bladder. The hepatic duct and branches were much enlarged, and filled with dark-green masses of nearly solid, inspissated bile. The liver was found much atrophied and soft, and very few liver-cells could be detected by the microscope, the tissue consisting of granular matter chiefly, with oil-globules and colouring-matter. This condition is very like that met with in the acute atrophy of the liver. The liver, however, may become very small, owing to the absorption of bile; without any destruction of its secretory cells. (See Frerichs, *op. cit.* vol. i. p. 117.) In accordance with the above statements would appear to be the observation of Dr. Harley (see *Proc. of Med.-Chir. Soc.* vol. iv. p. 111), who, in pointing out a means of diagnosing jaundice from obstruction and from suppression by the examination of the urine, observes that the former may pass into the latter. Mr. Holmes, when relating the case of extreme dilatation of the biliary passages, owing to obstruction already alluded to (see p. 183), remarks, however, that the hepatic cells were easily found by the microscope, but few of them containing bile.

† This author (see his work on *Diseases of the Liver*, p. 166) also men-

there was ulcer of the jejunum; and in case III. ulceration of the duodenum unconnected with that of the gall-bladder.) Budd also thinks that calculi might be formed, and inflammation set up by this morbid state of the bile as a common cause. Cases are on record in which rupture of this viscus appears to have followed over-distension;* and if this be really so, why may we not suppose that, under some circumstances, it may give rise to inflammation and other results, especially if the coats of the bladder have previously been degenerated? Thus, in the tenth volume of the *Transactions of the Pathological Society*, p. 177, is related by Dr. Leared a case of death from hæmorrhage, owing to rupture of a gall-bladder which was in a sloughing state, and adherent to the stomach, the common bile-duct being blocked-up by a gall-stone. In this instance the liver was healthy.

For the following interesting case of rupture of the viscus, I am indebted to the kindness of Dr. Day, of Stafford :

CASE VII. *Rupture of the gall-bladder, and escape of its contents into the peritoneal cavity. Ulceration of the cystic duct, which contained a gall-stone.*

G. L., æt. 47, a shoemaker by trade, was admitted into the Infirmary on August 3d, 1864: his habits were described as having been intemperate, and he presented a very emaciated appearance. The chest had the characteristic shoemaker's form (flattened). His conjunctivæ were suffused with bile, and his skin was of a greenish-yellow colour. The account given by his friends as to his previous condition was as follows :

He had been ailing for many months, and for three or four weeks before coming to the Infirmary he had suffered from nausea, retchings, and diarrhœa, the stools being semi-solid and quite white.

Some days prior to his admission he had complained of a sensation of heaviness and discomfort about his stomach; he had had no medical

tions the case of a patient who died with cholera, and in whom extensive ulceration of the gall-bladder was found after death, no symptoms referable to the same having ever existed.

* Cruveilhier (op. cit. p. 219) doubts the occurrence of rupture of the urinary or gall-bladder from distension, without inflammation having previously existed. He quotes (p. 220) a remarkable case of enormous distension of an inflamed gall-bladder, caused by blocking-up of the common bile-duct by a calculus, and rupture. The bladder at first formed a large hard tumour, simulating circumscribed hepatitis, when suddenly it softened and shrank, was afterwards punctured, and more than two soup-plates of bile flowed out.

Rokitansky (op. cit. p. 156) speaks of the biliary passages being so distended by obstruction as "not unfrequently to induce rupture." At p. 158, however, he says that spontaneous rupture is generally preceded or accompanied by inflammatory action.

advice. A few hours before he was brought to the Infirmary he was seized with intense pain in epigastric region, coming on in paroxysms, and with such severity that he rolled on the floor; his family (he was married) being under the impression that he was in a fit.

Upon first seeing him he presented the appearance before described. His pulse was 110. Cardiac sounds natural. There was a considerable amount of dulness upon percussion below the left clavicle, with harsh respiration over the whole extent of the left lung. The right lung afforded no physical symptom indicating disease. Respiration, 21 in the minute. He was feverish; did not perspire, and complained of thirst. Below the false ribs on the right side, and extending beyond and below the middle line of the epigastrium, was a swelling of considerable size and somewhat pear-shape in form: it was so exquisitely tender, that he could scarcely bear any pressure upon it, and the whole liver appeared to extend beyond its natural limits; any attempt at manipulation in this locality made him excessively uncomfortable. The paroxysms of pain occurred at intervals, and his agony on each occasion was very great.

The treatment employed consisted of hot fomentations; the warm bath; a chloroform pad applied over the epigastrium; opium and chloroform given by mouth; the phosphate and carbonate of soda in a bitter infusion, with the administration of infusion of rhubarb and compound decoction of aloes as an aperient.

Although the chloroform administered internally seemed to afford him the most relief, he never showed any very marked and decided improvement; and on the fifth day after his admission he had a terribly severe paroxysm; on its subsidence, which took place somewhat suddenly, he had a "rigor," became in a state of collapse, and died.

Post-mortem examination. The left lung had a large amount of tuberculous matter at the upper part, and the bronchial tubes and air-cells of this lung contained a considerable amount of thin but tenacious fluid. The right lung was studded at various parts with small particles of tuberculous material; there was no cavity in either lung. The heart was natural in size and condition, although somewhat pushed apparently from its normal position by the flattening of the chest.

The liver was much enlarged; dark-red in colour, and so exceedingly soft, that it almost broke to pieces when being handled. The gall-bladder had burst, and its contents were diffused in the general cavity of the abdomen. The cystic duct, which was much changed, was plugged-up with a triangular-formed gall-stone, and ulceration of the coats of the duct had taken place. The ductus communis chole-dochus was enormously distended with inspissated biliary matter; so thick indeed was its consistency, that it might truly be called semi-solid. The kidneys were much congested, but otherwise healthy. Pancreas and spleen both healthy; but all the organs seemed more or less tinged with bile. Several small gall-stones were found outside the gall-bladder, they having, of course, escaped at the period of the viscus giving way.

Andral also (op. cit. p. 561) describes a case of softening

and rupture of the gall-bladder in a man aged 64; the cystic and common bile-ducts being obliterated, and their walls thickened and in a state of chronic inflammation. A case of rupture of the gall-bladder and ductus choledochus, is described in the *Boston Medical and Surgical Journal* for February 20th, 1868.*

The hepatic duct even may also give way.

Thus Andral relates a case (see tom. ii. p. 556 of his *Clinique Médicale*) in which rupture of this duct seemed to have occurred, owing to obliteration of the common duct, causing peritonitis and rapid collapse. I will here quote a remarkable case, related by Dr. M'Swiny to the Dublin Pathological Society (see *Dublin Quarterly Journal* for Nov. 1866, p. 518), of rupture of the common bile-duct, which does not appear to have been previously diseased. This rupture was supposed to be the result of distension, owing to starvation, as it was "a well-ascertained fact that long privation of food usually caused an accumulation of bile in the gall-bladder to an enormous extent." Of course, also cancerous or other morbid growths in the walls of the bladder or ducts may result in ulceration and perforation. Again, also considering the anatomical character of the gall-bladder and biliary duct, the presence of follicles and glands in the mucous membrane, &c.,† it is not unnatural to suppose that we may at times have inflammation of its glandular elements, with exudation and the formation of small abscesses beneath the mucous membrane, which may ulcerate, and so to say, make an open sore—just, in fact, as we have in the case of the intestines or stomach; and this may proceed to perforative and fistulous communication with adjacent viscera, set up secondary abscesses in the liver-substance,‡ open into the portal vein,§ cause abscesses, &c.

* Frerichs, op. cit. p. 191, speaking of *icterus gravidarum*, quotes a case from J. P. Frank, in which fatal rupture of the gall-bladder occurred during delivery.

† Respecting the functions of the mucous membrane of the gall-bladder, see a recent paper by Kemp, quoted in Canstatt's *Jahrbuch*, vol. i. 1859, p. 62; and on the glands of the same, see a paper by Luschka, quoted in Henle u. Pfeuffer's *Zeitschr.* 3 reihe, vol. iv. 1859.

‡ Rokitsansky (loc. cit. p. 159) speaks of suppurating and ulcerating perforation of the gall-bladder, and suppuration of the liver or lesser omentum following.

§ Budd (op. cit. p. 175) quotes from Dance a case of ulcer of the common

Still, most pathological authorities competent to speak on the subject concur in thinking that when ulcerative communication has existed between the gall-bladder and neighbouring viscera, the fistula has been caused by biliary calculi in the bladder. Cruveilhier thought so, as may be seen in his *Traité d'Anatomie Pathologique Générale* (tom. ii. p. 541), under the heading of "Fistules biliaires bimuqueuses." Budd, again (see op. cit. p. 174), observes that he had met with no instance of ulceration of the gall-bladder perforating the coats of the bowel, except when produced by a gall-stone. That ulceration, however, of the gall-bladder may arise not from gall-stones or any other cause acting upon it from within, but from causes acting *from without* the viscus, might be expected under some (no doubt rare) circumstances; and the following case illustrates ulcerative perforation of the gall-bladder, decidedly proceeding not from any prior morbid state of the inner surface of the organ, but from without, viz. from the stomach; presenting us with the early stage of a cystico-gastric fistula, the rarest of all varieties of cystic fistulæ.

CASE VIII. *Ulceration of the stomach, with corresponding ulceration of the serous surface of the gall-bladder.*

William F., æt. 37, a soldier, was admitted into St. George's Hospital, February 3d, 1847, with symptoms of diseased heart and kidneys, following rheumatic fever. His complexion was of a dingy-yellow colour. On the 12th, diarrhœa came on, and on the 16th rigors and vomiting. Then pain and tension of the abdomen resulted, and an almost imperceptible pulse. In spite of stimulants, opium, and other remedies, collapse became extreme, and he died on the 17th.

Post-mortem examination. In addition to hypertrophy and valvular disease of the heart, pericardial adhesions and extreme granular disease of the kidneys, much sero-purulent fluid and shreddy lymph were found in the peritoneal cavity; and the following condition of the gall-bladder was discovered: the under surface of this bag was loosely adherent to the anterior coat of the stomach, within an inch of the pyloric extremity; on separating these adhesions, the peritoneal coat of the gall-bladder was found destroyed by ulceration to about three-quarters of an inch in diameter; and an ulcerated opening existed in the anterior wall of the stomach corresponding to this, and which had been covered by it. The edges of the ulcer were somewhat thickened, as well as the whole circumference of the stomach at this part, and somewhat contracted; the

bile-duct which ate into the portal vein, within which suppurative inflammation was established.

thickening being chiefly between the peritoneal and mucous coats, but whether of a malignant character appeared (to Mr. Pollock, who made the post-mortem examination) very doubtful. [49.]

You will the more readily recognise the possibility of ulceration of the gall-bladder proceeding from the stomach, when you bear in mind that ulceration of the stomach is not infrequent in which the ulcer is closed by adhesion to the pancreas, liver, &c.*

I may here, before quitting our consideration of the above cases of biliary fistulæ,† direct your attention to the ample summary and able consideration of gastro-colic fistulæ by Dr. Murchison, in the *Edinburgh Medical Journal* for July 1857, in which you will find, incidentally introduced, a compilation from English and foreign sources, up to the year 1851, of cases of the five forms of cystic fistulæ, viz. cystico-gastric, cystico-colic, cystico-duodenal fistulæ between the gall-bladder and the external surface of the abdomen, and between the same viscus and the peritoneal cavity. You will read that the cystico-duodenal is the most common form;‡ and next

* A curious case, showing ulceration of the *external* surface of the gall-bladder, was described in the *Medical Times and Gazette*, March 22, 1862, as occurring at St. Bartholomew's Hospital. It was that of a woman with femoral hernia, in which the gall-bladder, which was distended, was contained in the sac, the liver extending into the iliac fossa. The gall-bladder was adherent to the abdominal wall at its apex, which was constricted, and "around almost its entire circumference, about an inch from the tip, was a line of ulceration, which had extended through the serous covering."

† In looking out for other illustrations of ulceration of the gall-bladder, such will be found in the catalogue of the Royal College of Surgeons. In Series xxix. No. 1456, is described a gall-bladder full of calculi, of which the inner surface was coarsely ulcerated and flocculent. No. 1460 also is a specimen of ulcerated communication between the gall-bladder and the duodenum.

Dr. Budd, in his work before quoted (p. 166), describes extensive ulceration of the gall-bladder found in a fatal case of cholera, no symptom of the affection having existed during life. Louis also, in his work on *Phthisis* (see Sydenham Society's translation, p. 103), speaks of a case in which the mucous membrane of the gall-bladder, which contained 200 calculi, was destroyed to the extent of one inch and two lines: near the neck similar destruction existed. In the *Transactions of the Pathological Society* (vol. i. p. 79), you will find described by Dr. Jenner the case of a lady, æt. 63, who had had two attacks supposed to be of acute hepatitis, and who died comatose. After death the liver was found small, the portal vessels contained a thin, reddish, purulent fluid, the gall-bladder was much thickened, and had several small round ulcers on its lining-membrane. In the same volume, p. 255, is also recorded by Dr. Peacock a case of ulcerative communication between the gall-bladder and duodenum, through which a biliary calculus had passed, and produced obstruction of the bowels.

‡ Cruveilhier (op. cit. p. 542) speaks of cystico-duodenal fistulæ as being the most frequent of all varieties.

to that the fistula communicating with the external surface of the abdomen.* I have no more to say about the above cases than to call your notice to the mention which is made of the subdivisions or partial partitions which existed in the cavities of the gall-bladder in case No. 1. As showing a similar peculiarity, I will yet quote you another case.

CASE IX. *Diseased gall-bladder divided into sacculi, one of which contained gall-stones.*

Sarah T., æt. 44, was admitted into St. George's Hospital on June 12th, 1844, with a constant sensation of sickness and occasional vomiting of a greenish fluid, attended by sharp pains in the right hypochondriac region. There was some diarrhoea, and the evacuations were clay-coloured. Subsequently slight delirium at night came on, and she gradually sank, and died July 4th.

Post-mortem examination. The lungs posteriorly were found engorged, but otherwise natural. All the abdominal organs were also healthy, except the gall-bladder, which was much thickened, and adherent to the duodenum, and also divided as to its cavity into two sacculi perfectly distinct from each other, the larger one being filled by two calculi and some thick inspissated bile, the lesser cavity being filled by thin transparent fluid. The various biliary ducts were pervious throughout. [146.]

It is difficult to say precisely what these partitions in the bladder signify. Possibly they may be in some instances congenital, and of the nature of malformations.† We certainly have congenital deviations in regard to the gall-bladder, as for example, absence of the organ altogether. Thus Rokitsansky (op. cit. vol. ii. p. 155 seq.), speaking of so-termed abnormalities of the biliary passages, says, that congenital absence exists, but is rare,‡ and must not be confounded

* This author has also related in the *Path. Soc.* (see vol. xii. p. 85) the case of a woman, aged 38, in whom a fistulous orifice in the abdominal walls opened into a circumscribed cavity which communicated with the interior of the colon and duodenum, and indirectly with the gall-bladder, in the walls of which was a large cicatrix.

† Professor Owen describes the gall-bladder of a giraffe as being bifid at its fundus, and describes it as being double in certain other animals.

‡ You possibly have learnt in your lectures on Comparative Anatomy that some animals exist which naturally are not provided with a gall-bladder. Thus it seems to be generally absent in the giraffe and deer, and Camelidæ and Perissodactyles, the sloth, and many vegetarian mammals. You may take some interest in referring to instances in which the gall-bladder had been wanting, and therefore I will take up a little of your time by naming one or two. In the *Medical Times and Gazette* for April 1864, at p. 476, Dr. J. Patterson has for example related the case of a man who died sud-

with that obliteration which frequently follows inflammation, and of which I might quote for you instances on record. One may suffice; viz. the one recorded by Dr. A. Simpson in the *Edinburgh Medical Journal* for May 1861, p. 1045. Again, we may have misplacement of the gall-bladder.

Cruveilhier (op. cit. p. 834) describes a case in which he found the gall-bladder at least four times its ordinary length, completely detached and resembling a piece of small intestine, and attached to the liver by a small mesentery.

There may then be also, probably, deviations as respects the arrangement of the inner or mucous coat of the gall-bladder, causing the septa above alluded to, which may be analogous to the spiral folds of the mucous membrane found in the common bile-duct. Whatever the origin, such dispositions of the inner membrane have before been noticed. Thus Rokitansky describes the gall-bladder as being divided longitudinally or transversely, owing to a rigid condition of internal folds.

The septa of the gall-bladder, of course, are of no consequence pathologically, excepting so far as they might, I would suggest, favour a tendency to the formation of concretions and calculi by assisting in arresting the gall contained in the bladder; and in case of the actual formation of such bodies, by helping to delay them in the cavity.

I may here allude (though I cannot show you any instances, or direct you to records of any in our Hospital experience) to a modification in the construction of the gall-bladder sometimes met with;—I mean dilatation or pouching of the walls of the organ. Such dilatations may,

denly, having enlarged fatty liver and disease of the kidneys. The gall-bladder was found to be entirely wanting, as also the cystic duct; neither (as it appears in the record) was there any duct found proceeding from the liver to the duodenum, though carefully searched for. Dr. Sands in 1865 exhibited to the New-York Pathological Society (see *New-York Med. Journal*, June 1865, p. 222) a liver without a gall-bladder, and also without the “lobus quadratus;” that is, the fissure in which the gall-bladder ought to lie did not exist, and therefore it was not marked off. Henle, in his *Anatomy*, quoting from Huschke, alludes to the absence of the gall-bladder in man; also to varieties in its size and position, and to division of its cavity by partitions. In the *Philosophical Transactions* you will see the case related of a woman in whom it was found that the gall-bladder was absent, its place being supplied by enlargement of the common bile-duct, which was wide enough to admit the little finger, and whose coats were as thick as those of an artery (see *Abst.* vol. ix. p. 649).

no doubt, in the human subject contain biliary calculi, and possibly are produced by the pressure of over-distension, very much as dilatation of the urinary bladder may be produced. If you will look into the Catalogue of the Royal College of Surgeons (see Series xxix. No. 1440), you will find described a specimen of the gall-bladder of an ox, presenting several partial dilatations or sacculi.

Reverting for a moment to ulceration of the inner surface of the gall-bladder, it is to be expected that this process might proceed to sloughing. I cannot show you any examples of this, but you will find that Budd speaks (*op. cit.* p. 171) of sloughing of the gall-bladder, arising from a general tendency to gangrene, as in cases of ulcer of the ilium in fever, and from previous damaging of the bladder. In the third volume of the *Transactions of the Pathological Society*, also, p. 100, you will find a case described by Dr. Ogier Ward, in which, in connection with a hydatid abscess and expulsion of hydatids on the right side, a sloughing portion of the gall-bladder came away.* In the tenth volume of the same *Transactions*, p. 177, is also related a case of sloughing of the gall-bladder, by Dr. Leared, in which death occurred from rupture, and consequent hæmorrhage into the peritoneal sac.

Another termination of inflammation of the gall-bladder, viz. abscess, is sometimes met with. Thus, at p. 88 of our Post-mortem Book for 1861, is the case of Charles S., æt. 63, who was admitted March 27th, and died April 10th, from encephaloid cancer of the stomach, œsophagus, liver, omentum, and peritoneum. After death the gall-bladder was found to contain a large number of gall-stones. It also contained a quantity of fluid which had all the appearance of pus. Similar cases of abscess of the gall-bladder you will find in the *Transactions of the Pathological Society*. Thus, in the first volume (p. 271), you will see related, by Dr. Coley, the case of a man, æt. 40, who for ten or twelve years had had a swelling below the umbilicus. This eventually burst at the navel; and after death it was found that the sac of the abscess consisted of the gall-bladder, the coats of which were very thick-

* In this case no less than one pint of pure bile was discharged per diem from the opening on the surface.

ened. The liver was perfectly healthy; but connected with the covering of the spleen was a large hydatid cyst. I would here observe that of course you may find pus in the gall-bladder in some cases, where you can find no sufficient disease of its walls to produce the same. Thus, Dr. Greenhow relates a case in the eighteenth volume of the *Pathological Society Transactions*, p. 117, where the gall-bladder was distended with red purulent fluid of the consistence of cream, and contained a recent blood-clot. The mucous membrane of the gall-bladder was congested merely. In this case there was extensive abscess of the liver. In some instances, no doubt, abscess of the liver may communicate with biliary ducts, and thus the gall-bladder be filled with pus without any disease of its coats. Andral (*op. cit.* p. 577) relates the case of a woman, æt. 47, who had extensive cancer of the liver, in whom the gall-bladder was found full of pus which had been secreted by its inflamed mucous membrane. Dr. Budd speaks of suppurative inflammation of the gall-bladder from permanent closure of the cystic duct.

But you must not suppose that inflammation of the gall-bladder, bile-ducts, or other appendages of the liver, necessarily leads to ulceration and sloughing or abscess. On the contrary, as I have before said, this termination is comparatively rare. You will, however, in making or watching post-mortem examinations, often meet with other consequences of this morbid action in the condition of THICKENING or INDURATION of the tissues. These states are often associated with a similar condition of Glisson's capsule, but may exist independently, and then may be associated with the presence of gall-stones or not. Thus, if you look over our Hospital records in 1866, you will find, in case 85, thickening and contraction of the gall-bladder and of Glisson's capsule; and at No. 225 of the same year, a similar thickening, as also in case 127 of the same year, and in case 175 in 1864. In 1865, at No. 64, thickening of the walls of the gall-bladder is mentioned as being apparently produced by serous effusion. In 1862, at No. 15, we have also thickening mentioned.

Louis, in his work on Phthisis already quoted, p. 103, mentions a case of thickening of the walls of the gall-bladder to twice their natural thickness, from infiltration with sero-

sity, and in two cases thickening from other causes. He observes that cases of thickening (as well as ulceration) of the gall-bladder occur in people with chronic hepatitis.

Induration of the walls of the gall-bladder may exist with or without thickening, but generally with it, no doubt, and having origin from the same cause. In the Catalogue of the College of Surgeons' Museum, at No. 1441 (Series xxix.), is described a case of such thickening and induration, the cystic duct being obliterated; at No. 1455 we have a case of induration, the bladder containing calculi, and being adherent to the duodenum; and at No. 1456 the walls of the gall-bladder are described as being indurated, and nearly a quarter of an inch thick.

Quitting now cases of inflammation of the gall-bladder and ducts, with its results, I will speak of an opposite condition, viz. atrophy; although, possibly, this condition may depend in some cases upon a previous process analogous to inflammation, in connection with the presence of calculi or not. Though I cannot demonstrate the fact, yet it is reasonable to conjecture that it may depend at times upon embolism of the cystic artery (a branch, you know, of the right division of the hepatic), by which it is supplied with blood;* or, again, upon pressure exercised upon this small vessel (which, as you will also remember, courses upwards along the cystic duct and neck of the gall-bladder) by calculi or concretions within that duct, or by pressure upon the vessel from without, as by inflammatory exudations, fibrinous bands, &c.; in the same manner as cirrhosis in cases of thickening of Glisson's capsule has been in part attributed to contraction of this tissue upon branches of the nutrient hepatic artery.

Fatty and other degeneration† of the coats of the gall-bladder and ducts may of course also lead to their atrophy; and mere want of use also, as when the cystic duct has been

* I need not delay you by demonstrations showing that atrophy of an organ or part, with its results, must follow cutting-off the supply of blood attendant on plugging of its nutrient artery. Of an entire organ thus starved I cannot quote for you a better example than that of atrophy of one kidney, which followed embolism of a renal artery, related by Dr. C. Evans to the Path. Soc.: see vol. xvii. p. 173.

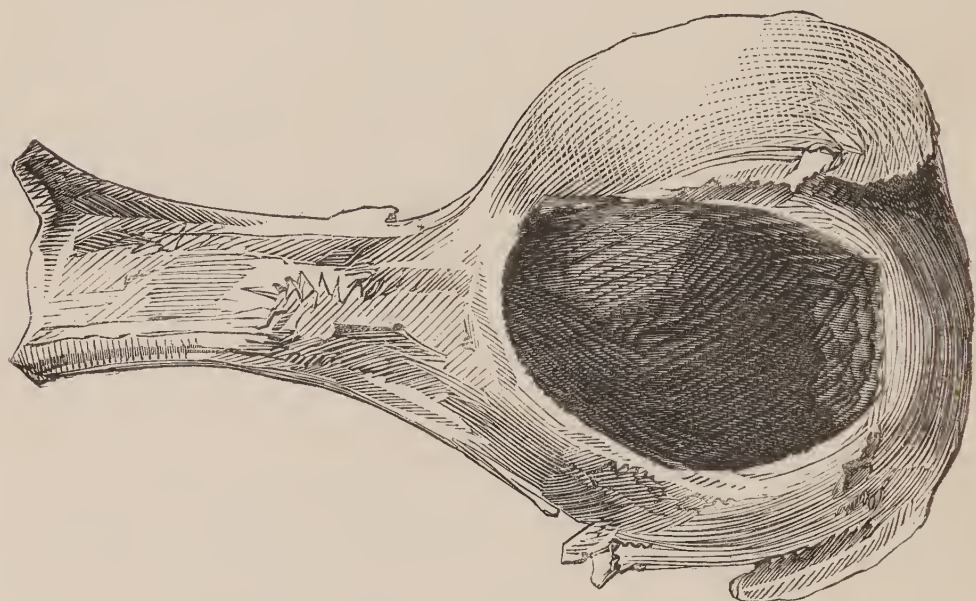
† A case of fatty degeneration of the mucous membrane of the gall-bladder, which was full of calculi, is described by Dr. Cooke in the *Brit. Med. Journ.* for Sept. 3, 1864, p. 277.

obstructed, may lead to atrophy. At any rate, whatever the causation, such cases of atrophy are to be met with.*

Following the notice of cases of atrophy of the gall-bladder, others may here be mentioned in which the contents of this reservoir are by no means in their natural state. Of course the bile, even in a state of health, is not always of the same colour and consistence, any more than other secretions or excretions are, and is modified, no doubt, in dependence upon the condition of the blood; but sometimes we find it in a very unwonted state, as you may often have seen it, thick and unusually dark—like liquid tar in look and consistency—approaching the state of inspissation and the concretory condition. This is, however, not the condition to which I would call your attention. I wish here to speak of certain cases in which the bile has lost its colour and consistency, and has been more or less (in some instances quite) replaced by a colourless, limpid, mucous fluid. This condition, though it may be found in cases of fatty liver when the bile scarcely contains anything but albumen and water, appears mostly to depend upon long detention of bile, owing to obstruction to its outflow. The bile, at least the colouring-matter (cholestearine being often found in it by aid of the microscope),

* In the tenth volume of the *Path. Soc. Trans.* p. 176, is related by Mr. J. Wood a case in which the only remains of a gall-bladder was a nodular mass of the size of a large pea, the obliteration being attributed to abscess either in the gall-bladder, on the neighbouring surface of the liver, or to gall-stones. Dr. Gibb, again, in the same volume, p. 179, relates a case in which, along with cancer of the liver and stomach, the gall-bladder was found shrivelled up, its coats much thickened, and containing a drachm of thick creamy pus and a gall-stone. Perhaps the most remarkable case that I could adduce is one related by Dr. Wilks to the *Path. Soc.* March 18, 1862, of an infant who from birth had never had any dark evacuation, and when a fortnight old had jaundice. When six weeks of age it died, and in place of a gall-bladder, amidst the areolar tissue occupying its place, a narrow channel was found just able to hold a bristle, and which was “no doubt the representative of the gall-bladder.” The bile-ducts also appeared quite obliterated. Cruveilhier (*op. cit.* p. 542), when speaking of cystico-duodenal fistula, says that it is not rare to find the gall-bladder quite empty, “revenue sur elle-même et atrophiee, semblable à un petit diverticulum de l’intestine.” Rokitsansky also (*op. cit.* p. 155) speaks of obliteration of the gall-bladder as consequent upon inflammation, and (p. 157) of a shrivelling of the same organ, accompanied by a diminution of its contents, from the same cause. At p. 160 he speaks of certain instances of inflammation of the gall-bladder which terminated by conversion of the organ into a fibrous callous tissue, the so-called obliteration. Andral also (*op. cit.* pp. 567 and 570) describes cases of disease of the liver in which the cystic and common ducts were “transformed into fibrous cords.”

becomes absorbed,* and the mucous membrane of the organ pale, secreting the thin fluid alluded to; in some instances it appears to assume the nature of a serous membrane, and the gall-bladder becomes distended by a quantity of serous fluid—in fact it becomes dropsical. In other instances also of obliteration or obstruction of excretions, the nature of the retained fluids changes, and they assume a mucous or serous character. This is seen in the case of the kidney, the salivary glands, the pancreas, &c. Here, in passing, I will call your attention to a specimen in our Museum of obstruction of the pancreatic duct (see Prep. 329 in Series ix.), owing to the pressure of carcinomatous material; in consequence of this a cyst of the size of a hen's egg has been formed, which



Woodcut showing a cyst of the pancreas, the result of obstruction of its duct.

originally contained dark-coloured fluid, as may be seen by the accompanying woodcut.†

* I might quote several cases from our Hospital records in which the gall-bladder was found full of limpid fluid. One only will suffice, viz. No. 30 in the Post-mortem Book for 1865. In this case the patient died from secondary abscesses following fracture of the leg. There had been no symptoms referable to the liver; but after death the cystic duct was found obliterated, and the gall-bladder full of limpid fluid. I may remind you that urine pent-up in the bladder, owing to obstruction in the urethra or enlarged prostate, or to paralysis, or to unconsciousness of the patient, is liable to become absorbed through the walls of the urinary bladder. The term “urinous fever” has been given to symptoms arising from such absorption: a probable instance of this I have placed on record in the *British Medical Journal* for April 6th, 1867, p. 384.

† Cruveilhier (op. cit. p. 227) speaks of his having seen several instances

I will now bring before your observation some cases of *Cancer* of the gall-bladder. Cases in which the gall-bladder was implicated along with the liver proper, I could quote in greater abundance, but I restrict myself to those rarer instances in which the structure of the liver was not involved except secondarily.

CASE X. *Carcinoma of the gall-bladder, which contained gall-stones.
Cancer of the liver.*

William H., æt. 38, was admitted into St. George's Hospital Oct. 25th, 1865, with pain in back and over the liver, to which had succeeded jaundice. On admission, in the region of the gall-bladder, close under the ribs, an oval tumour was easily felt (which had been noticed seven weeks), immovable to any extent, and of about the size of a large walnut. It altered with change of position, and the hand could be partially got under it. As the patient got thinner, the tumour could be more easily recognised. Jaundice became more decided, and he emaciated greatly; the urine becoming more bile-tinged and darker, and the evacuations lighter-coloured. He remained conscious to the last, and died January 3d.

After death, the diaphragm was found very adherent to the liver, which contained a few small nodules of encephaloid cancer. The gall-bladder contained three large stones, each about an inch in diameter, and one of these was impacted at the mouth of the cystic duct. The gall-bladder was greatly distended with bile, and its coats nearly uniformly thickened by a layer of malignant growth spread, as it were, in the place of the mucous membrane. The serous coat was unaffected. The glands of the small omentum were occupied by carcinomatous material. [3.]

CASE XI. *Carcinoma of the gall-bladder, which contained gall-stones
Carcinoma of the ovaries.*

Sarah R., æt. 69, was admitted into St. George's Hospital Nov. 17th, 1858, with bronchitis, ascites, and ovarian disease. Paracentesis abdominis was performed twice. She died Feb. 13th, 1859, with effusion into the pleural cavities.

Post-mortem examination. The pelvis was found occupied by a carcinomatous mass which had taken origin in the ovaries, in which, on the left side, a large cyst existed. The heart, lungs, uterus, bladder, liver, spleen, and kidneys were healthy; but the coats of the gall-bladder were infiltrated by soft cancer, forming a tumour of the size of a goose's egg, and in this several gall-stones were embedded.* [38.]

of obstruction of the pancreatic duct; but in all his cases the contained fluid (unlike that in the case quoted) was transparent, and like mucus both in appearance and in chemical composition.

* See Hospital Catalogue: Series ix. No. 324.

CASE XII. *Carcinoma of the gall-bladder and of the biliary passages generally.*

Matthew R. was admitted into St. George's Hospital Dec. 4th, 1850, and died Jan. 1st. No history of the life-symptoms exists; but after death I found the liver extensively occupied by medullary carcinoma. The other organs of the body were healthy. The gall-bladder contained no bile; but in its place a large quantity of light-green tenacious mucus. Its coats were thickened, and towards the commencement of the cystic duct, which was pervious except at its junction with the gall-bladder, were infiltrated with light-coloured carcinomatous material, more thickly so lower down, and involving also the whole of the biliary passages. The entrance into the gall-bladder was quite occluded, and the lining-membrane of the bladder was highly injected, but without any medullary appearance.* [1.]

CASE XIII. *Carcinoma of the gall-bladder, which contained gall-stones.*

The patient, æt. 38, was admitted into the Hospital in 1866, with jaundice. A round tumour was felt under the ribs on the right side. He sank, and died, with symptoms of prostration and cachexia; and after death the gall-bladder was found dilated and occupied by three large gall-stones. Its coats were thickened by a layer of carcinomatous growth, which occupied the place of the mucous membrane, the serous coat being unaffected. There was much hard fibroid tissue in the liver-substance near the gall-bladder.† [3.]

Sometimes cancer of the gall-bladder and intestine, united as they are found to be, leads to fistulous communication between the cavities of those organs, but I cannot offer to you notes of any fresh cases.

You will also find in our Post-mortem Book for 1850 a case (No. 226) in which a tubercle of cancer was met with in the walls of the gall-bladder, the liver being free from disease. There was carcinoma of the pancreas and stomach.

Again, in the *Transactions of the Pathological Society* two or three instances are described. Thus, in vol. viii. p. 243, Dr. Markham describes the case of a woman aged 28 who had a hard swelling near the pyloric end of the stomach, and whose symptoms led to the idea that she had cancer of that organ. After death, the gall-bladder was found converted into a hard scirrhus mass, of the size of a large pear, the disease having evidently commenced in the tissues of the viscus, from which "it had, at one or two points, thrown out

* For preparation of the gall-bladder see Hospital Pathological Catalogue, Series ix. No. 323.

† You will find the specimens of the diseased gall-bladder in the appendix to Series ix. of our Pathological Museum Catalogue, No. 349.

processes into the liver.” The gall-bladder was full of gall-stones, and the cystic ducts impervious. Cancerous deposits were found beneath the peritoneum in many parts. In the eighteenth volume of the Transactions also, at p. 140, a remarkable case of villous cancer of the gall-bladder is related by Dr. Moxon. The patient during life had a tumour of the size of a child’s head, which after death turned out to be the gall-bladder adherent to the abdominal walls, to the duodenum and stomach, and to the colon, with the cavity of which it communicated. The bladder was full of villous carcinomatous matter growing from its walls, and extending into the cystic and common bile-ducts. Secondary masses existed in the substance of the liver.*

Rokitansky (loc. cit. p. 161) describes cancer of the biliary passages as being chiefly met with as a complication of cancer of the liver, and as occurring either as an idiopathic nodulated deposit in the submucous tissue, or as cancerous infiltration of the mucous membrane, or as being implicated by growths in the neighbourhood perforating its parietes.

The last morbid condition of the gall-bladder which I propose to illustrate and bring before your notice, is that in which its walls contain certain deposits of *calcareous matter* of various kinds. Of this the preparation in my hand (No. 322 in Series ix. of the Museum) furnishes an example. It consists of a portion of liver with the gall-bladder attached, in the upper part of which calcareous material is seen. At this part the walls of the gall-bladder are greatly thickened by a fibroid deposit, and the inner surface of the viscus in the neighbourhood is lined by a thin lamina of fibrinous exudation. I found, on *microscopical* examination, that the fibroid material had all the characteristics of what is termed atheromatous deposit. In the Museum of the College of Surgeons also you will see a preparation (No. 1443, Series xxix.) showing plates of earthy matter in the walls of the gall-bladder; and such a condition, as well as fatty degeneration, is described by Dr. Budd (see p. 190 of his work already

* Dr. Foote brought before the Dublin Pathological Society for Dr. Stokes a very interesting case of extensive cancer of the gall-bladder, with slight implication of the duodenum, pancreas, and colon. A contiguous part of the liver only was affected. (See *Dublin Quarterly Journal* for May 1865, p. 467.)

cited). The Transactions of our Pathological Society will furnish you with such specimens. Thus, in vol. iii. at p. 100 is described a case of hydatids with sloughing of the gall-bladder (already quoted, see p. 196), the wall of the bladder containing calcareous plates; and at p. 238 of the seventh volume is described a case of cirrhosis of the liver and enlarged spleen, in which the inner surface of the gall-bladder, which was collapsed, was found to be perfectly white, and encrusted with fragments of a white earthy matter, many of which were firmly adherent. The neck of the bladder was blocked-up by this material. Andral (op. cit. p. 575) describes a case of osseous concretions and development of muscular-looking fibres in the walls of the gall-bladder, which was in a state of chronic inflammation.

As regards the pathology of such cases as I have quoted above, I suppose that in some instances, as in the one in our Museum, the calcareous matter was the result of conversion of fibrinous and fibroid material thrown out between the coats under some inflammatory action.*

* Similar deposits are sometimes found in connection with the substance of the liver itself. Thus you will find, at case No. 68 in our Post-mortem Book for 1862, a case in which a deposit of calcareous matter was found near the surface of the liver, and was most likely connected with the subserous tissue. Of such a nature also are the plates and masses of calcareous concretions often found imbedded in the fibrous capsule of the spleen. You will find a good specimen of this which I added to the Museum, having removed it from the body of a man who died with erysipelas (see Series x. No. 49. Post-mortem Book, 1851, p. 828). Mr. Cæsar Hawkins also gave to the Museum part of the capsule of a spleen containing calcareous plates (see No. 50 in same series). Such also are those cases of calcareous and bony rings and plates found in connection with the surface of the heart amidst adhesions of thickening of the pericardium; and of this you will find some good illustrations in our collection (see Series vi. Nos. 7, 8, 9; described also in *Trans. of Path. Soc.* vol. xi. pp. 72, 73). Such also the bony plates in connection with false membranes and adhesions in the pleural cavities. One such, a highly-interesting specimen, formed part of the boundaries and lining of a vomica in the lungs, and was described to the Pathological Society (see vol. xiii. p. 25) by Mr. Browning. Such also the bony plates connected with the cerebral and spinal arachnoid and dura mater, of which we have some specimens. In the pathological collection at Oxford is a specimen, No. 845, showing ossification of the choroid membrane of the eye, a very rare condition, I believe. Such also those, of more infrequent occurrence, found in connection with the substance of the mucous membrane. Of this rarity you can see an instance described by Dr. Wilks in the eighth volume of the *Path. Soc. Trans.* p. 88, the structure of the mucous membrane, as well as the structure beneath of the larynx, trachea, and bronchi in a phthisical patient being covered by patches of true bony material.

In other cases the calcareous deposit is on the inner surface of the bladder, and arises from the concentration of fluids inside the viscus. Rokitsansky alludes (op. cit. p. 157) to the formation in this way of an adipose chalky pulp within shrivelled gall-bladders, “with a subsequent ossification of the parietes.” Later on (p. 164) he alludes to concretions in the gall-ducts which consist of carbonate of lime, and are not products of the bile, “but of the hæmorrhagic mucus and pus of the gall-bladder.” Probably in the case described by Andral (op. cit. p. 570) the three small concretions of a dull-white colour and formed of phosphate of lime had a similar origin.

To be mentioned along with the above cases are those in which biliary concretions or gall-stones have been found within the substance of the walls of the gall-bladder, *i. e.* beneath the mucous membrane. Thus, you will find described, No. 19 in our Post-mortem Book for 1861, the case of a woman who died with fractured femur, in whom gall-stones were found beneath the mucous membrane of the bladder.

Dr. Gross, of Philadelphia, also records a case in which several biliary calculi were formed in separate sacs beneath the mucous membrane.* In such cases it must have happened that ulceration of the mucous membrane has occurred, and that gall-stones or concretions have been imbedded in the ulcer, which has subsequently closed over and healed;† or else that saccular dilatations of the parietes (such as I alluded to at p. 195) have formed, owing to pressure of the concretions, or that, if formed from any cause, the concretions have subsequently lodged there.

At another opportunity I hope to be able to bring before your notice cases and preparations illustrating certain pathological conditions of other appendages of the liver, viz. the blood-vessels.

JOHN W. OGLE, M.D.

As an appendix, I will add the following very interesting case of dilated gall-bladder, for which I am indebted to Dr.

* Quoted by Dr. Gibb in the ninth volume of the *Path. Soc. Trans.* p. 233.

† In Dr. Thudichum's work already quoted, you will find mention of impaction of biliary calculi in the walls of the gall-bladder, in pouches or ab-

Day, of Stafford. I received it too late for insertion at p. 187, where I alluded to similar cases.

CASE XIV.—Richard B., a miner, 35 years old, was admitted as an in-patient at the Stafford County Infirmary, under my care, on October 2, 1868.

He was very far from being an intelligent man, and the friends who accompanied him when he came to the Institution were as obtuse as himself; so that the previous history of the case was arrived at with no little difficulty. It was stated that he had been in the habit of drinking spirits very freely, but had nevertheless enjoyed good health until about three years previously to his admission, when he had a fall from a great height, and hurt his left side. Soon after this his abdomen began to swell, and became very large: he suffered great pain, and was laid-up for a fortnight, after which he appeared to be quite well, and resumed his work, and continued at it until two months ago, when he caught cold and began to swell again.

Appearance and condition on admission.—He was much emaciated, slightly jaundiced, countenance pinched; dyspnœa so great that he was obliged to be propped-up in bed; no appetite, bowels constipated, urine scanty and full of lithates (sp. grav. 1015). No albumen present, but a small amount of bile. Pulse 92, hard and jerking; temperature $98\frac{2}{3}^{\circ}$. Heart-sounds normal; respiration, 20 in the minute; neither crepitation nor ronchus, but dulness on percussion; commenced on the right side about the fourth rib, on the left a little lower.

The whole abdomen was distended, and fluctuation could be felt in all parts. There was a distinct bulging of the right side; the left was slightly retracted, and between the iliac crest and the ribs on this side there was a marked depression. The spleen was enlarged, and reaching down to the centre of the depression. The liver could not be felt, owing to the amount of fluid present. The superficial abdominal veins were enlarged, and there was some œdema of the legs.

He was ordered milk-diet, with beef-tea; his bowels were kept open with small doses of podophyllin, and he took a mixture containing phosphate and carbonate of soda, sp. æther. chl., and compound infusion of gentian.

For a fortnight after his admission he appeared to improve; the size of the abdomen became less, and he regained his appetite. Now, however, he became tympanitic, and this could only be relieved by the administration of enemata.

On the 28th of October his scrotum and legs became very œdematous, and increased so rapidly, that the house-surgeon punctured the scrotum the following morning, and let out a large amount of fluid. The œdema, notwithstanding this, continued to increase until his death, which took place on the 30th of October. A very short time before his death he vomited a considerable quantity of dark blood.

normal passages, which formations are to be distinguished from peculiar concretions found in the glands, in the walls of the gall-bladder, and not derived from bile.

Post-mortem examination.—This was made the day after his death. Externally the abdomen presented the same inequalities that were noticed upon his admission, and a correct representation of which you have in the photograph.

Upon opening the chest, no unusual condition of the organs contained in it was observed beyond that occasioned by the pressure exercised by the large amount of fluid in the abdominal cavity. The lungs were healthy, and so was the heart, but the latter organ was rather small in size.

A very considerable quantity of pale straw-coloured fluid escaped when the abdomen was opened.

The liver was of a dirty-yellow or ochre colour, and occupied its usual position; but from its thin edge, which was somewhat rounded, there was dependent what appeared to be a large cyst. This was somewhat pyriform in shape, and extended downwards and to the right, reaching almost to the crest of the ilium. There was, apparently, no gall-bladder; this cyst occupying the place of that viscus. The covering of the cyst was everywhere perfectly continuous with the proper covering of the liver, and there was *no* trace of the cystic duct. The common duct was pervious, and opened in its normal position. The liver weighed 2 pounds 15 oz., and broke down upon the application of very slight pressure. Upon section, it presented a nutmeg appearance, the hepatic cells being of a pale-yellow colour and containing many fat or oil globules.

The coats of the cyst, or gall-bladder, were very thin, and easily—in fact too easily—broken when the liver was being removed. The contents escaped so rapidly that I was unable to measure the amount, but, at a guess, I should say the fluid must have been *not* less than four pints. The liquid was turbid and watery, being also slightly tinged with bile. A microscopic examination afforded no evidence of the presence of echinococci.

The spleen was hypertrophied, and weighed 1 pound 14 oz.

The pancreas, although small, displayed no disease. The kidneys were healthy.

The stomach contained a great deal of dark, grumous-looking blood, and the capillaries of the internal coat were all in a state of congestion. There was no ulceration, or ruptured blood-vessel of any kind.

The urinary bladder was healthy, and contained a small amount of urine.

I forgot to say that in the parenchyma of the liver I found not a little leucine and tyrosine. I must also add that the cyst, or gall-bladder, had no connection whatever with the ductus communis.

The transverse colon was firmly attached to the liver, and everywhere adhesions of the firmest and strongest description existed between the various abdominal organs and the surrounding parts.

The head was not opened.

The blood, examined before death, showed no unusual number of “white cells.”



XV. A CASE OF ANEURYSM.

THE following account presents an interesting example of thoracic aneurysm. The patient was a Polish gentleman, who suffered, in addition to his malady, many unhappy vicissitudes of fortune. For more than a year the progress of the disease, already far advanced, was arrested in its course by a simple plan of treatment which resulted in "spontaneous cure" of the aneurysm. Every facility was afforded after death of ascertaining the pathological changes which took place during the process of coagulation. From the post-mortem examination was also obtained a rational explanation of the symptoms which occurred during life. In addition to these reasons for publishing this case, there was the fact that it offered a very favourable opportunity for deciding an important question in the pathology of the disease.

The age of the patient was 53. He presented himself at St. George's Hospital in November 1864, stating that he had been suffering from symptoms of consumption for the past six months. He was requested to attend as out-patient, which he continued to do until the month of April, when the cough and difficulty of breathing had become so distressing as to prevent him from leaving home. The upper part of the front of the thorax on the left side was distinctly more prominent than natural. At the most elevated part of the prominence, between the third and fourth costal cartilages, there was a slight depression apparent to the eye, and a round perforation was felt in the parietes of the thorax about the size of a shilling. The skin which covered the part was seen to rise and fall with each pulsation of the heart. The sensation communicated to the finger when placed gently upon it left no doubt of the serious nature of the disease, and of the danger which was to be apprehended of the thin layer of integumentary covering yielding to the repeated pressure from within. The whole prominent surface was in other parts firm and even; that is to say, the ribs could be clearly felt, and appeared only to have become more curved than natural in the situation of the aneurysmal tumour. The elevated surface of the thorax could be covered with the palm of the hand and extended

fingers. It was perfectly dull on percussion. A distinct impulse was communicated to the hand by every pulsation of the heart, but there was neither thrill nor bruit. For three nights he had been restless, and disturbed by great difficulty of breathing and alarming spasm of the glottis. The voice was audibly clear, but interrupted by dyspnœa, and frequently reduced to a whisper. The cough was attended with abundant mucous expectoration, raised without difficulty. When the cough remitted and the respiration was quiet, the patient appeared in good spirits, and gave no indication of serious disease except by a faint stridulous sound in the larynx. A considerable quantity of blood had been discharged from the bowels, and still continued to pass away whenever they acted. The increase of his symptoms within the last few days was attributed by the patient to the want of sufficient nourishment and mental distress combined.

A large opium-plaster was applied to the thorax so firmly as to afford support to the integument, and with a view to alleviate the cough and spasm. An expectorant mixture containing a small quantity of opium was administered internally. The hæmorrhage from the bowels was considered proof of a state of congestion which naturally found relief in that manner, and it appeared more proper to encourage than arrest it. The bad effect which the opiate might have had was obviated by administering an active purgative draught every other morning.

The most perfect tranquillity, and repose in the recumbent posture, were positively insisted upon, and willingly adhered to by the patient. For three days the active symptoms continued gradually to diminish. The spasm of the glottis would return at night, but in less severe paroxysms. The fourth night was passed tranquilly and in undisturbed sleep. At the end of the first week the purgative draught was discontinued, and the opiate reduced in quantity. On two occasions, during the three weeks which were allowed to pass before it was considered safe to disturb the patient in any way whatever, opportunities were allowed of examining the thorax without changing the position in which he was found at the time of the visit; for usually he reclined so much on the left side as to render an examination impossible.

The stethoscope was placed on the centre of the plaster. The only sound heard was that of the cardiac valves transmitted clearly to the ear. On placing the hand upon the part, there was a feeling of solidity which it is difficult to

describe. The symptoms had diminished to such a degree as to allow of removal of the plaster. No pulsation could now be seen, and no impulse felt. It was apparent that the happy and desired result had been obtained. In order to allow the coagulation and deposit of fibrin to be undisturbed, the patient remained for another week in bed, occasionally sitting up supported by pillows. He was then allowed to sit up for a few hours daily. The only treatment required was an occasional purgative draught, as it was observed that the cough was more relieved by attention to the bowels than by the expectorant mixture.

On May 19th he walked to the Hospital, a distance of a mile from his home, and looked remarkably strong and well. During the summer he continued in the enjoyment of tolerably good health. In the autumn, however, in consequence of over-exertion, the symptoms gradually returned, and the disease made such progress, that in December it was considered advisable to admit the patient into the Hospital.

December 13th, 1865. Aneurysm of the aorta.—The disease, the patient stated, had been coming on for more than a year. The tumour appeared about the size of the fist; was situated a little to the left of the sternum and just below the clavicle. To all appearance the integument formed the only covering of the anterior part of the aneurysmal sac. Between the third and fourth costal cartilages was another pulsating tumour about the size of a walnut. The large tumour protruded from the thorax about $1\frac{1}{2}$ inches. Both tumours were fluctuating and pulsating, but no sound could be heard except a slight purring in the smaller tumour. The action of the heart was tolerably regular. There was a faint systolic murmur audible at the base of the heart. The right pulse was weaker than the left. The patient spoke in a whisper, suffered from bronchitis, had a cadaverous appearance, and was very weak. He constantly passed blood at stool. The chief treatment adopted was the internal administration of acetate of lead. When he left the Hospital, on February 21st, 1866, the tumour had undergone no change. The bronchitis and other symptoms were much the same, and his general health was not so good as when he was admitted. He returned home and made some improvement; for in April he was able to walk a distance of more than a mile on a business matter once every five weeks. The exertion, however, was always followed by increased suffering for four or five days. The tumour at that time felt somewhat firmer, and the integument was in the same state as when he left the Hospital. Thus he continued during the summer. October 11th, 1866, the following measurements of the tumour were taken: round the base 12 in.; transversely $5\frac{1}{2}$ in.; vertically $6\frac{1}{4}$ in.

On the 14th February 1867, the wife of the patient sent word to say that her husband had expired in the night. In a state of excitement, the previous afternoon, he had left his bed and hurriedly descended the stairs. In the evening he appeared fatigued, but otherwise well as usual. About midnight his wife was summoned by his knocking in an unusual manner against the wall between their rooms. She hastened to his assistance, and found him sitting up in bed quietly feeling his pulse. He asked feebly for vinegar, and while she was supporting his head, he sank back and expired.

The aneurysmal sac was filled with layers of fibrinous de-

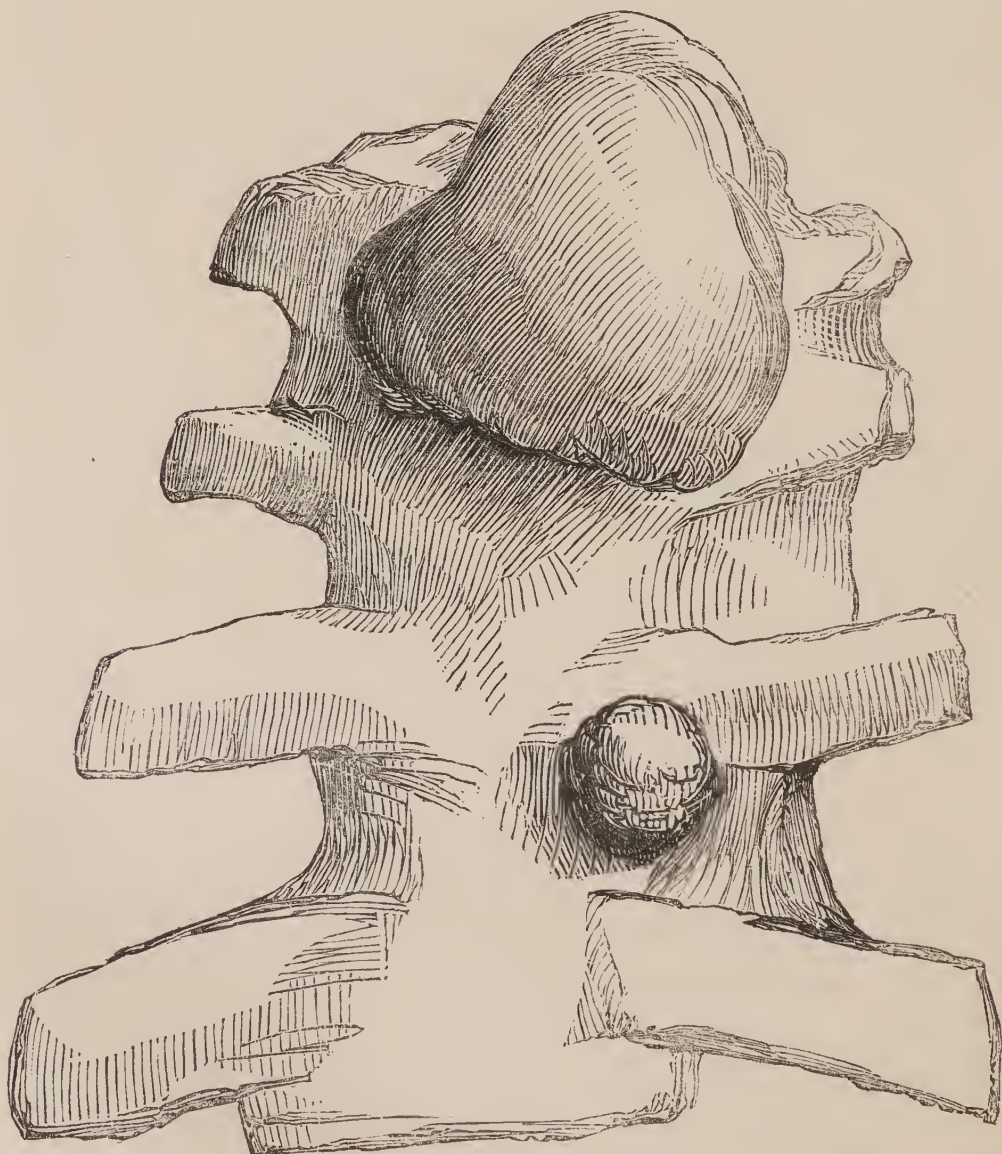


Fig. 1.

posit and coagulated blood; the former adherent chiefly to the posterior wall of the sac, the latter occupying the central and anterior parts.

Fig. 1 gives a view of the position and dimension of the tumours which protruded through the intercostal spaces.

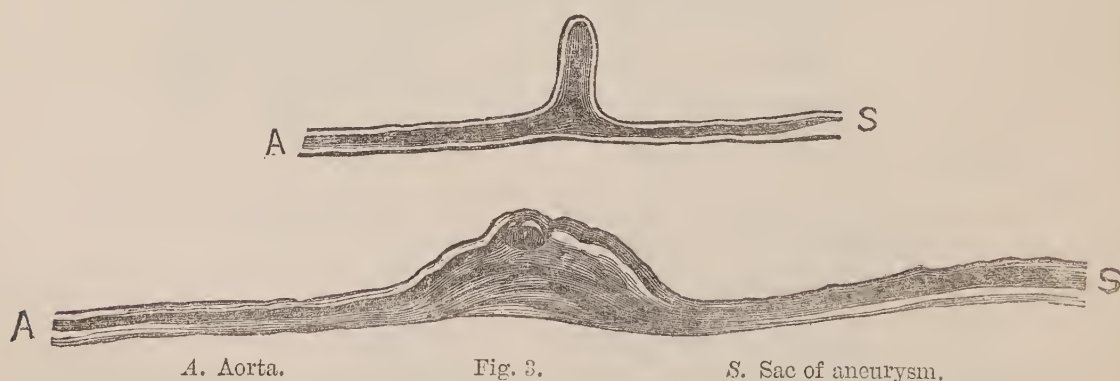
Fig. 2 exhibits a lateral view, from which the relative position of the principal arteries, the innominate, carotid, and



Fig. 2.

subclavian, is apparent. The recurrent nerves were traced without much difficulty. That on the right side was but little implicated in the disease. The filaments on the left side were much stretched and attenuated by the aneurysmal sac. There was no change, however, of their intimate structure. In order not to divert attention unnecessarily from the important pathological point in this case, it is considered sufficient to state that the other organs of the body were found to be healthy, with the exception of slight general congestion of the lungs, and calcareous deposits in the aortic valves, and to a small extent in some parts of the aorta.

In a few words the pathological point, to which allusion has been made, may be briefly stated. It was the fact that the internal coat of the aorta had extended almost throughout the whole aneurysmal sac without change or rupture. The only part of the aneurysm in which the membrane could not be demonstrated was the large pulsating tumour in the upper part of the thorax. The reason of this was apparent, from the rough surface of exposed bone which formed the orifice of the tumour. It appeared remarkable that a sac so large should have been formed without rupture of the internal coat of the aorta. Attention is directed to the diagram (fig. 3), which exhibits sections of the strong ridge or collar of tissue which separated the aorta from the sac, and en-



circled the orifice of the aneurysm. From this it is seen, that not only has the internal coat of the aorta extended into the sac, but that the middle coat likewise forms a part of its walls. The existence of the second coat could not be equally clearly demonstrated in all parts of the circumference of the orifice. An additional proof of the existence of both coats in

the sac was found in the fact that there were many small ætheromatous deposits in various parts of its walls. Indeed, so perfect were the two coats in some situations, as to form a thick and strong structure inferior only in elasticity to the aorta itself.

Again, the large sac was found to have yielded at one part, and to have given rise to a smaller sac formed apparently from the primary sac, in exactly the same manner as that had been produced from the aorta.

Fig. 4 shows a section of the large and small sacs, with the ring of tissue which surrounded the orifice between them.



S. Sac of small aneurysm.

Fig. 4.

S. Sac of large aneurysm.

In order to understand the origin of the remarkable process of disease which has been described, it is necessary to attend to a short description of another part of the aorta where it was found commencing, and in its earliest stage.

Separated from the vessel by a distinct circular margin was a slightly bulging surface, which may be compared, for the sake of illustration, to the skin of the palm of the hand when corrugated by bringing the fingers and thumb together so as to form a hollow or cup. The diameter of the part of the vessel thus affected was about an inch and three-quarters. On holding it to the light, it was seen to be thinner and more transparent in those parts where the corrugations existed; that is to say, the coats appeared to be traversed by lines of attenuation, through which the light was more apparent than in the portions interposed.

Thus far the description has been confined to general appearances as presented to the unaided sight. It is considered proper to conclude this communication without extending it to the inquiry into the causes which gave rise to the morbid changes in the coats of the aorta, or at least to a minute examination of the tissues in which the disease primarily appeared. There are two questions regarding the treatment which the results of observation induce me to pro-

pose to those who are engaged in active hospital practice. The first is, whether the wards of a hospital afford the conditions most favourable for the object which is desired, when a case of aneurysm is admitted under the care of the physician. The second question is, whether there are fair and reasonable grounds for pursuing the mode of treatment which is at present generally adopted in cases of thoracic aneurysms similar to that which has been described above.

R. J. LEE, M.B.

XVI. A SERIES OF FATAL CASES OF POISONING.

THE following cases* from our pathological records illustrate the effects of poisons, as well organic as inorganic, on the human body. In all of them the results of dissection after death are given; and although in several instances the bodies were brought into the Hospital dead, and therefore the effects during life of the noxious agents were not observed and noted, yet in the majority the symptoms which were produced are recorded. The details of these symptoms in conjunction with the post-mortem appearances may constitute a not altogether useless contribution to the study of toxicology.

Among the cases of death from organic poisons will be found instances arising from the action of oxalic acid, hydrocyanic acid in some form or other, of opium, of chloroform, and amylene. Among those from inorganic poisons will be found those arising from caustic potash, sulphate of zinc, arsenic, perchloride of mercury (corrosive sublimate), sulphuric acid, and hydrochloric acid.

I. ORGANIC POISONS.

CASE I. *Poisoning by oxalic acid. Lungs and stomach congested; heart and liver fatty.*

Richard G., æt. 31, was admitted August 3d, 1860, into the Hospital very shortly after swallowing a quantity of oxalic acid, with a very agitated nervous manner,† and in a state of prostration, having a very feeble pulse and great coldness of the extremities. An emetic produced vomiting of a large quantity of a greenish liquid, smelling of

* Of these, one or two have been already placed on record in the journals either by myself or others.

† It seems that Christison and Coindet found by experiments on animals that narcotism and tetanus were occasioned by small doses of oxalic acid. Casper also describes tetanus and paralysis of the heart as resulting from oxalic acid, if it be so diluted as to be absorbed.

"spirits." A burning feeling along the œsophagus, and cramps in both legs, were complained of. He vomited his food. (His face was bloated; and it appeared that he had been intemperate for many years, and frequently had had delirium tremens.) Chalk-mixture and brandy were given, and sinapisms applied to the epigastrium.

On the day after admission he was better in some respects, but was still vomiting all his food, and the epigastric pain was complained of. Laudanum was added to his medicine, poppy fomentations applied to the abdomen, and strong beef-tea enemata administered. On the night of the 7th great restlessness came on; and early on the following morning, having relieved his bowels, he died before he could get back into bed.

Post-mortem examination.—Thorax. The lungs were congested, and the heart's walls extremely fatty.

Abdomen. The walls of the stomach were somewhat congested, and it contained a quantity of bloody fluid; otherwise it was natural. The liver was fatty, and the kidneys were large and soft.

Cranium. The brain and membrane were in all respects natural. [221.]

It is somewhat singular that we should have, as I believe, but one case of fatal poisoning by oxalic acid, seeing that this form of poisoning is not an uncommon one in England. The usual symptoms were manifest in this case, but it is remarkable that such slight post-mortem changes were found.

CASE II. *Poisoning by hydrocyanic acid. Congestion of the lungs and kidneys; remarkable injection and colour of the stomach.*

William P., æt. 38, was brought to the Hospital dead, in 1851. He had appropriated money which was not his own, and had committed suicide, a bottle which had contained prussic acid having been found in his bed-room.

Post-mortem examination.—There was much lividity of the anterior part of the throat and the back of the body.

Thorax. Old pleuritic adhesions existed. Both lungs were of a dark-brown colour, and poured out copious red frothy fluid upon incision; they were, however, quite crepitant. The heart was natural in structure, excepting the right tricuspid orifice, which was very large; its lining-membrane was very dark, and contained no clot and but very little dark fluid blood in its cavities. The inner surface of the vessels at the base of the heart, which contained much fluid blood, was very crimson.

Cranium. The brain was slightly congested as to its superficial veins. Each ventricle contained about a drachm of clear reddish fluid. Their lining-membrane, the choroid plexuses, and velum interpositum were very congested. A moderate quantity of fluid existed under the arachnoid.

Abdomen. A slight amount of clear red fluid existed in the abdominal cavity, and in places old-standing adhesions. The veins of the intestines were prominent and full. The stomach contained about 2 oz. of dark-brown red thick substance, smelling very much of prussic acid, as did also all the viscera when examined. The lining-membrane of the stomach was of the same brownish-red colour in places, being most intensely injected; its walls being softer than natural. The glands in the neighbourhood of the stomach were large. The duodenum and commencement of the ilium were congested, the remainder of the bowel being pale. The liver was large, and of a greenish-brown colour on section. The kidneys were congested, but smooth. Other organs were natural. [88.]

CASE III. *Poisoning by hydrocyanic acid. Lungs, stomach, and intestines congested; heart free from clot.*

A man was brought in dead, March 14th, 1852, having been observed to fall down in the Park, and been almost dead when picked up.

Post-mortem examination.—The conjunctivæ of the eyes were found injected; the pupils were natural. Blood was smeared on the tongue, which was not, however, ascertained to be bitten.

Thorax. Slight pleural adhesions existed, and much red fluid in both pleural sacs. The lungs and bronchial membrane were very injected, and slight puckering and cretaceous deposit existed at the apex of one lung. The heart had one or two white patches on its surface, and weighed $13\frac{1}{2}$ oz. It contained no clots in its cavities, and the walls of the left ventricle were very thickened.

Cranium. Much blood existed in the veins of the scalp, and the brain was congested, but nothing more.

Abdomen. On opening this cavity a very strong smell of bitter almonds was noticed. The surface of the intestines was slightly vascular. The stomach and intestines seemed quite healthy in structure, but were congested, and contained a slight amount of fluid having a strong smell of almonds. The liver contained much fluid blood. The spleen was soft and large, having a thick opaque white capsule. The kidneys were dark, and of a purple colour. [67.]

CASE IV. *Poisoning by hydrocyanic acid. Lungs congested; heart empty; urinary bladder very contracted.*

John B. A., æt. 25, was admitted July 27th, 1859, in a state of unconsciousness, having been found in the Park in that state, and it was said also in convulsions. In his pocket was an empty bottle smelling strongly of oil of almonds. The surface of the body was cold; and he was nearly pulseless. The breath smelt strongly of oil of almonds; respiration was free. *The pupils were very dilated.* He had no power of swallowing. In spite of the use of the stomach-pump, galvanism, &c. he never rallied, and died half an hour after admission.

Post-mortem examination.—The rigor mortis of the limbs was very unusually strong.

Thorax. The lungs were loaded with blood; the cavities of the heart were empty, and the left ventricle semi-contracted.

Abdomen. The lining-membrane of the stomach was stained of a purple colour, and its contents smelt strongly of bitter almonds. The liver was healthy. The kidneys were congested; the bladder empty and firmly contracted; the other organs were natural.

Cranium. The scalp was congested; the brain was healthy in all respects.

Throughout the body the blood was noticed as being very fluid. [175.]

CASE V. *Poisoning by oil of bitter almonds.*

Joseph A. G., æt. 52, was brought into the Hospital dead, October 15th, 1863.

Post-mortem examination.—Rigor mortis of the limbs was very well marked. The body was well made.

Abdomen. The stomach was found to contain a dark fluid smelling strongly and giving the chemical reaction of bitter almonds. [255.]

CASE VI. *Poisoning by oil of bitter almonds.*

John H., æt. 57, was admitted Jan. 3d, 1866, at 10.40 A.M. He had taken two drachms of the oil of almonds at 10.20 A.M., one hour after breakfast. Emetics were at once ineffectually administered. On admission, he was speechless and pulseless, and cold in his extremities. *The pupils were dilated*, and breathing hurried; the tongue furred, and fauces and uvula congested and œdematous. The smell of the oil was very perceptible about him. After the stomach-pump was used and remedies resorted to, he quickly recovered for a time, and the pulse returned, beating nearly 90 per minute. The pupils became more contracted, extremities warmer, &c.; and he was doing well until 11.30, when vomiting came on. The face became dark and purple, the breathing hurried, and convulsions were imminent. He became quite insensible, the jaws became closed, and the pulse rapid. The breathing became spasmodic, and the motions passed involuntarily; there was also a blowing action of the right buccinator muscle, and diminished sensibility of the right eye. In spite of cold douches, brandy, galvanism, &c., he died. Respiration went on once or twice after the heart had ceased to beat.

Post-mortem examination.—The rigor mortis was well marked.

Cranium. Much blood existed in the scalp, veins of the skull, and cerebral vessels. The cerebral ventricles were nearly empty. The brain smelt of the bitter almonds.

Thorax. Both lungs were congested behind. The left ventricle of the heart was quite closely contracted, the right one contracted and containing decolorised coagulum.

Abdomen. The stomach contained much blood and mucus, and the mucous membrane at the great curvature was congested, and of a bright-pink colour. A decided smell of the almonds existed in the contents. The other organs were natural.

Fauces. The mucous membrane of the fauces and other parts of the larynx was œdematous.

Excepting the coagulum in the heart, the blood generally was fluid. [4.]

CASE VII. *Poisoning by hydrocyanic acid. Lungs, liver, and stomach congested.*

Thomas A., æt. 38, was brought in dead, June 18th, 1868, having been picked up in the Park, a bottle holding an ounce being found near him. No particular smell could be detected either in the bottle or near the mouth of the man. The weather was at the time very hot, and the patient was brought to the Hospital at midday. He had threatened to commit suicide previously.

Post-mortem examination.—Thorax. The lungs were very congested, and gorged with black blood. The left ventricle of the heart was contracted; the right one dilated, containing a small clot. The mitral valve was slightly thickened along its free edge. The right auricle was dilated, and the right auriculo-ventricular orifice enlarged. The walls of the left ventricle were thickened.

Cranium. The brain was very congested, and dripping with serum. There was also a large amount of fluid in the ventricles.

Abdomen. The liver was congested and slightly fatty. The spleen was soft and diffuent; the kidneys much congested. The walls of the stomach were congested. It contained about an ounce of reddish fluid, and had a strong odour of hydrocyanic acid. [186.]

In all the above-described cases of poisoning by prussic acid, the odour of the acid was perceptible in the body after death. This is not always so, it appears, inasmuch as it is not to be detected generally until death has happened several days, owing to its ready decomposition when in combination with organic matters. Casper quotes a case in which even twenty-six hours after death no trace of it could be found, but a large quantity of formic acid, owing to metamorphosis of the prussic acid. Casper has since then been able to confirm this discovery. In one case of poisoning by prussic acid and ethereal oils, he quaintly describes the body as a "sweet-smelling body." In phosphorus-poisoning the metal, being easily oxidised, is soon destroyed in the body. In the above cases of poisoning by hydrocyanic acid, the finding of a fluid state of the blood is quite in accordance with the observations of others, as also the congestion of the liver, stomach, and kidneys. The brain was not in all cases congested.

Casper describes a case of poisoning by cherry-laurel water,

in which, though consciousness remained entire apparently, the patient was quite unable to use a single voluntary muscle of tongue, play of face or limb. Nevertheless, with this complete paralysis of motion, he had violent convulsive action of the face at times. This paralysing action of the motor nerves, as distinguished from the sensory ones, is akin to that produced by curare, &c.

CASE VIII. *Poisoning by opium. Blood in the arachnoid cavity; lungs congested.*

James F., æt. 40, was brought in dead January 27th, 1841.

Post-mortem examination.—Numerous patches of ecchymosis existed on the surface of the body, evidently the result of flagellation. The face was livid, and much effused blood existed beneath the scalp. The limbs were very rigid.

Cranium. Much dark fluid blood was found in the arachnoid sac.* The brain on section showed many dark bloody puncta. A slight amount of clear fluid existed in the ventricular cavities.

Thorax. The lungs were very gorged with blood. The heart contained no clot, and no blood in any of its cavities; but a large amount of black fluid existed in the thoracic aorta.

Abdomen. The stomach contained three-quarters of a pint of brown-coloured fluid, in which were solid brown masses, the whole smelling strongly of opium; and from the stomach contents morphia and meconic acid were chemically obtained. The mucous membrane of the stomach was very pale. The contents of the duodenum also smelt strongly of opium. The bladder contained a very small amount of urine. The kidneys were much congested. Other viscera were natural. [226.]

CASE IX. *Poisoning by opium. Lungs congested. Peculiar bony deposit in the mucous membrane of the trachea.*

Henry Y., æt. 50, was admitted May 19th, 1847, in a state of unconsciousness after swallowing a quantity of laudanum (said to be 2 oz.) about four or five hours before admission. * Various means had been tried before he was brought to the Hospital. On admission the breathing was stertorous, and he could not by any means be roused. The pupils were very contracted; the pulse almost imperceptible. The stomach-pump was abundantly used and diffusible stimulants given. He was pinched and slapped and galvanised, and mustard-poultices applied to the extremities. After the lapse of an hour he began to show signs of amendment, and could be roused to temporary consciousness. Brandy was given by the mouth; and a small quantity of this having apparently found its way into the trachea, he almost immediately died in a state of suffocation.

* Extravasation of the blood within the brain has also been observed in alcohol-poisoning.

Post-mortem examination.—The body was in a good condition. Bruisings existed on the surface.

Neck and thorax. Peculiar atheromatous masses were found growing from the inner surface of the trachea below the larynx, containing *true bone* within them, roughening the surface. This deposit had manifestly originated in the mucous membrane itself: and other parts of the membrane in the neighbourhood presented the early stages of atheroma.

The lungs were loaded posteriorly, and also contained some crude tubercle at their apices. The heart was natural.

Abdomen. The stomach contained a quantity of grayish-coloured fluid; but no smell of laudanum or opium could be detected. Its mucous membrane was natural. Other viscera were natural.

Cranium. The contents were not examined. [116.]

CASE X. *Poisoning by opium. Absence of any particular morbid appearances after death.*

Elizabeth M., æt. 49, was admitted November 2d, 1856, in a state of unconsciousness, having swallowed, it was said, a teacupful of laudanum. The stomach-pump was used, also friction and galvanism, enemata, &c., and strong coffee and other things given in vain, and she died in between seven and eight hours.

Post-mortem examination.—*Thorax.* The heart was healthy; the right cavities being full of blood, and partly contracted. The lungs were congested and oedematous; pleural sacs natural.

Abdomen. A small cicatrix of an (old?) ulcer was found in the inner surface of the stomach, near the lower curvature. The liver was of a pale light-brown colour. The kidneys and all other organs were natural.

Cranium. The brain was found to be healthy, and no congestion nor effusion in connection with the membranes or ventricles was met with. [249.]

CASE XI. *Poisoning by opium. Absence of post-mortem appearances, excepting disease of the kidneys.*

A man, name unknown, about 42 years of age, was brought into the Hospital, August 16, 1856, at 8.30 P.M. from the Park, where he had been lying, it was alleged, since 1 P.M. in the same position, the knees being partially drawn up. A ginger-beer bottle was found by his side. I happened to be at the Hospital when he was brought, and saw him. The bottle was produced, but it was empty, and I could not ascertain that it smelt of anything particular. On admission, the surface of his body was cold, and the fingers blue. The lips, and especially the lower one, were slightly blue and swelled. The eyes were closed, and the eyeballs turned upwards and slightly *outwards* (both of them). The pupils were very contracted. *I found that all the limbs were quite flaccid,** and would remain wherever placed. There was a good deal of

* In most cases of poisoning by opium no doubt the limbs are flaccid, yet in some cases they are rigid. Neligan describes instances of spasms coming on during opium-poisoning. This is the case with many of the lower animals;

tremor of the various limbs. The heart's action could not be felt; but the pulse could slightly, being about 90 per minute, and very irregular. The respiration was very slow. The stomach-pump was at once used. In about a quarter of an hour the pulse became scarcely perceptible, and the respiration stertorous; the evacuations were passed involuntarily. I found that all reflex action of the eyelids was lost, but power of deglutition still remained. The jaws became very firmly fixed, requiring force to get in the stomach-pump. Nothing, however, was drawn from the stomach, and it was well washed out with water, which acquired a slightly brown colour. Galvanism all over the trunk, face, neck, and limbs was used, and expansion of the chest attempted by it. The respiration at times became quicker and more gasping. Counter-irritation of the extremities was resorted to, as well as remedies, suitable stimulants, coffee, &c. In about an hour the pulse rose, and the colour of the face became more natural, and the skin of the chest and abdomen warmer. The stertor of the breathing departed, but the pupils remained the same. I left the Hospital at 9.45 o'clock; and I heard next morning that the patient died shortly after I saw him last.

Post-mortem examination.—The pupils of both eyes were very slightly contracted.

Thorax. The lungs were very congested; the heart was natural, and its walls firm; the left ventricle was about three-fourths closed, and contained much firm discoloured fibrine.

Abdomen. The kidneys were granular, but the other abdominal organs were natural.

Cranium. The cranial contents were natural, no extensive congestion and no extreme effusion of fluid being found in connection with the cavities or membranes. [197.]

CASE XII. *Poisoning by opium or malt liquor. Congestion of the cerebral veins; serous effusion in cerebral ventricles.*

Denton W., aged 32, was admitted July 9th, 1859, in a state of unconsciousness, and almost comatose. He had been picked up, and was supposed to be in an extreme state of intoxication. No information about him could be ascertained. He could be roused by speaking, and evidently felt anyone pinching him sharply. The pupils were slightly smaller than they ought to be, but not very markedly so. A quantity of beery fluid was removed by the stomach-pump, and sulphate-of-zinc emetics and other things were given, but in vain, and he died on the day of admission.

and in some eastern countries delirious convulsions are caused in man by its use. It has also been found that a solution of opium applied to the surface of a rabbit's brain causes tetanic spasms (see *Canst.* 1861, vol. i. p. 192). Casper also describes, among the symptoms of poisoning by opium and its compounds, "fits of spasms extending even to general convulsions." Tetanus is even described by some observers as being produced by opium. The remembrance of these facts may be useful in cases wherein it is doubtful whether the symptoms are the result of brain-lesion or poisoning.

Post-mortem examination.—*Thorax.* The lungs and pleuræ were natural; the heart was large, lax, and fatty.

Abdomen. The stomach was congested, and contained some beef-tea. Chemical examination did not prove the existence of opium in the fluid. The liver was healthy; the kidneys congested.

Cranium. The brain-substance was natural, but its ventricles were full of serum, and its veins and sinuses loaded with fluid blood. [159.]

CASE XIII. *Poisoning by opium. Brain and lungs congested; heart's cavities contracted.*

Leopold K., æt. 28, was admitted May 13, 1862, in a state of unconsciousness from (as the friends thought) intoxication. He very quickly fell into a sleep, from which he could not be roused. On first admission *the limbs were flaccid*, the surface of the body cold and livid; the pupils were inactive and contracted. No reflex action could be roused in the eyes or eyelids. The pulse was full as strong, and 90 per minute. The respiration very variable, and often only 5 per minute. Under the influence of heat to the limbs, and galvanism to the chest, slight temporary improvement occurred; but he quickly sank and died. At the time of death the pupils became very *dilated*.

Post-mortem examination.—*Thorax.* The lungs were congested; a slight amount of digested food was found in the trachea. The right ventricle of the heart was contracted, containing but a slight amount of dark clot. Both ventricles were also contracted on slender blood-clots.

Abdomen. The stomach was full of greenish, half-digested food, and traces of meconic acid and morphia were found in its contents. The kidneys, liver, and spleen were healthy.

Cranium. The scalp was congested. The brain was congested, and two patches of ecchymosis were found at the vertex beneath the arachnoid membrane. The lateral ventricles contained a slight amount of fluid blood.

The soft palate was found to be cleft along the middle line throughout its entire length, and much thickened. [129.]

I will here refer to a most interesting case of poisoning in an infant by opium, which was brought into our Hospital Nov. 28, 1851, and which we had the gratification of seeing restored to health only after the use of galvanism (kept up assiduously by relays of students) after many hours. This case is reported in the *Medical Times and Gazette* for Oct. 3d, 1863. In this case it was noticed that galvanism across the cheeks caused most crying and arousing of the child's energies; that along the back most writhing and contortions. When applied across the thorax, most sobbing and crying was caused; and when along the line of the diaphragm, much sobbing, but not crying. A peculiar phenome-

non was noticed about this child when comatose; and that was, that one half of the lips and mouth would frequently become much paler than the remainder, which was very dark and livid, the darkness gradually passing off like the vanishing of a shadow. This was no doubt due to some modification of vaso-motor influence.

I will here also notice a peculiar fact which I watched when Faradising a man who had taken an overdose of opium. It was that after the withdrawal of the galvanism the contracted state of the muscles thereby produced remained for one or two seconds before disappearing: the muscular excitability being roused, it was not soon lost. This accords with what I observed on one occasion in a woman, when, after parturition, a tendency to muscular rigidity of the abdominal muscles remained for some time, being easily set up by any intestinal irritation.

I will also allude to a case of poisoning said to be from *aconite*, which some years ago came into the Hospital, and died. My colleague, Dr. Barclay, who at the time was our Medical Registrar, has obligingly given me the following particulars of the case: It was that of a boy, Richard M., aged 17, an apothecary's apprentice, who was admitted, having, as reported, just swallowed from one to two ounces of very strong tincture of *aconite*. "He was quite conscious, but very excited, and thrown into spasm by a touch. He was unable to swallow, and his pupils were very dilated." He died not long after admission. We were unable to procure a post-mortem examination; but the great resemblance of the symptoms to those of tetanus made me think the mention of the case, even without the results of such examination, would be of interest.

CASE XIV. *Death from chloroform.*

Eliza H., æt. 37, was admitted April 26, 1854, with a small mammary tumour, and though of feeble general health, without any organic disease. After a week or two's treatment with reference to general health, the operation for removal of the tumour was commenced. After taking chloroform for a short time, it was suddenly found that she was pulseless. She was very pale. Ammonia was given, artificial respiration resorted to, and galvanism. Whilst having water dashed on her face, she was noticed to make two faint, gasping attempts at respiration. She died very quickly afterwards.

Post-mortem examination.—*Thorax.* I found the left lung somewhat, though not very, congested; but the other one more so, especially posteriorly. The pericardium contained a slight amount of yellow fluid. The heart, except a slight degree of thickening of the aortic valve-flaps, was quite natural. The left ventricle was firmly contracted and closed, but the cavities on the right side were full of fluid and weakly-clotted blood. The muscular structure, as seen under the microscope, was slightly fatty. The coronary vessels natural.

The larynx and trachea presented nothing unusual.

Cranium. The meningeal vessels were very full, and a tolerable amount of subarachnoïdean and ventricular fluid existed. The brain-substance was quite natural.

Abdomen. The kidneys were congested; the other abdominal organs were natural, excepting that a biliary calculus obstructed the cystic duct, producing distension of the gall-bladder. The stomach quite empty. The urinary bladder was contracted and empty.

The blood was examined chemically by Dr. Snow for chloroform, but none was found in it.* [128.]

I am not aware that in any of our fatal cases of poisoning by chloroform the blood was examined under the microscope. An American physician reported in 1861 (see Sydenham Society's *Year-Book* and *Boston Med.-Chir. Trans.*) that in a case of such poisoning the blood-corpuscles were shrunk in a very conspicuous and peculiar manner. He stated that in that case the blood of the right side of the heart was found to contain formic acid; and explained this by the

* The following case of attempt to commit suicide by chloroform, which I watched for a time, occurred in our Hospital many years ago. The patient, Henry P., aged 25, who had been in the navy, was admitted with syphilitic sores. He had had in his possession for some time (as it turned out) a quantity of chloroform, and about 10 o'clock p.m. he swallowed a small bottleful ($3\frac{1}{2}$ oz.), and then told the nurse what he had done. Fortunately he vomited immediately. He became quickly intoxicated and very wild in manner; then became unconscious, and so remained until next morning. During this time his pupils kept becoming contracted, and then dilated; and spasm of the diaphragm occurred from time to time all night. There was also stertor and a jerky pulse. The stomach-pump was resorted to, cold-water douches, and galvanism at intervals. At 7 A.M. he was so far recovered as to be competent to walk and run along the room; and he was sick after some hot coffee. He had no pain. Calomel and senna were given to him. He went on well. On the day but one after the accident his pupils were still dilated, and he was inactive and stupid; he had much pain at the epigastrium, and some degree of fever. He went out of hospital quite well. Casper, in his *Forensic Medicine*, vol. ii. p. 300, describes the case of a druggist who committed suicide by taking chloroform. In this case there was no smell of the chloroform about the body (examined 60 hours after death), nor was there any microscopic alteration of the blood. The heart was flaccid and empty, and, as it were, folded together, as was also the case in another instance quoted by Casper.

supposition that when chloroform is inhaled the blood takes chlorine from, and gives oxygen to, the chloroform, thereby changing it into formic acid;* and some of the blood is at the same time changed chemically, and rendered unable to act as a stimulus to the vital organs, and thus occasions death. He counsels the admixture of a large proportion of pure ether with the chloroform, by which means we dilute the dangerous with a safe anæsthetic agent, and overcome the deadly depressing influence of the chloroform by the stimulating effects of the ether. Casper, however, I find discredits this statement, as he relies on the assertion of Dr. Hoppe, a judicial expert at Berlin, and Professor Mitscherlich, that chloroform cannot *chemically* be discovered in the blood of men and animals killed by it. In the article on chloroform, however, in the *Nouveau Dictionnaire de Médecine et de Chirurgie*, a process is given for detecting this agent in organs of the body; and it is shown that chloroform and anæsthetics generally become fixed more in the liver and brain-tissue than in other parts. And it is stated by another authority, that in poisoning by chloroform, the brain and spinal cord contain ten times more chloroform than an equal weight of other tissues of the body. Dr. Snow recovered chlorine from the blood of an animal killed by inhaling the vapour of chloroform. Sansom, in the *Medical Times and Gazette* for April 1861, describing the action of chloroform, concludes that it acts on the proteinous cell-wall of the blood-corpuscle, producing corrugation, alteration of shape, coherence, coalescence of cell-contents, and actual solution. I will here refer to the fact of the condition of the blood in phosphorus-poisoning. Casper, in his work on *Forensic Medicine*, relates two cases in which the blood-corpuscles were deprived of colouring-matter, and were colourless and transparent; the colouring-matter being dissolved in the uncoagulated plasma, the whole presenting the appearance of a sirupy cherry-red translucent fluid. He describes a similar destruction of blood-corpuscles by poisoning with a solution of caustic soda, and by suffocation in carbonic acid and sulphuretted hydrogen gases. He suggests that death

* Chloroform consists of one equivalent of formyle and three of chlorine, whilst formic acid consists of one equivalent of formyle and three of oxygen.

in such cases, and in the case of many other poisons, occurs dynamically by destruction of the life of the blood; and he classes chloroform among the nerve-paralysing poisons. He states that "one single dentist in Berlin chloroforms several thousand patients yearly, and has not yet met with one single case of accident;" and says that, as by far the greater number of patients have been successfully chloroformed without any peculiar inhaling apparatus, but simply with towels and sponges, there is no reason for preferring the use of any apparatus.

I cannot refrain here from quoting the words of the late Dr. Snow, who was so well known and esteemed at St. George's Hospital ("*doctor noster ille 'per æthera notus' Nix,*" as happily described by the Harveian orator in 1850), regarding certain cases of death from chloroform which occurred in London and elsewhere in the year 1853. After reviewing the histories of all the recorded cases of death from this cause, he observes that it was ascertained "that the fatal event did not arise in any instance from the too long administration of vapour sufficiently diluted with air," but from the air breathed being too highly charged with chloroform. It ought at no time to exceed five per cent. He strongly insisted on the fact that if air be properly admixed with chloroform, the pulse is of secondary importance as an indication of the effects of chloroform; and that the breathing and the state of the eyes and eyelids afford the best indications of the condition of the patient. He remarks that the cause of accident has always been that the vapour being too strong has acted so quickly that there was no time to judge of its effects. Casper, in his work already alluded to, quotes from the report (received Oct. 31, 1848) of the commission on the action of chloroform, appointed by the Academy of Medicine at Paris, the regulations which they recommend for the use of chloroform, among which is the following: "During the inhalation, care must be taken that the vapour of chloroform is sufficiently mixed with atmospheric air, and that the respiration continues free." In 1857, the Academy again considered the best mode of administering chloroform, and decided that no apparatus was required, and that every medical man must use it as he liked. Casper seems to coincide with this view. Dr. Snow, however, strongly opposes its use in so incautious a manner.

He remarks, on consideration of all fatal cases (those between 40 and 50), that the patients appeared to have been, on the whole, as healthy as those who had taken chloroform satisfactorily. Even when a weak and intermitting pulse and tendency to syncope exist, and there is arcus senilis of the cornea, he seems to think that, if very carefully done, chloroform may be administered, as he imagines that no more harm would be likely to follow from it than from the pain and mental disturbance accompanying the operation.

CASE XV. *Death from chloroform.*

Henry C., in general good health, æt. 30, admitted September 16th, 1863, for disease of the tibia, for which the bone was trephined September 24th. Whilst almost under its influence suddenly his pulse became almost lost. He gasped three or four times, and then died. In spite of cold effusion, galvanism in various parts, artificial respiration, the use of needles inserted into the heart, in connection with galvanism, he died.

Post-mortem examination.—*Cranium.* Dura mater injected. Arachnoid somewhat thickened, with some excess of clear fluid beneath it. The brain substance was dark and dripping with blood, and the cerebellum particularly so.

Thorax. The pericardium contained much turbid yellowish fluid. The right ventricle was uncontracted; the left one partially so. The valves were all healthy. Around the fibres of the right ventricle of the heart were found under the microscope to be rather fatty. The walls of the other cavities were natural. The lungs were natural, except that at the under part of the left one was a small extravasation of blood beneath the pleura, and the lower part of the right was congested.

Abdomen. Owing to the fluid state of the blood the viscera were of a very dark colour. The bladder was full of urine. [233.]

CASE XVI. *Death from amylene.**

George T., age unknown, was admitted March 18th, 1857, with severe epithelial tumours on the back. For some of them he had previously been operated on. After admission, some of the tumours, which proved to be recurrent, were removed whilst he was under chloroform two or three times, and excepting on the last occasion, when there was some difficulty in inhaling the chloroform, and he was much convulsed, but soon recovered. On the 30th of July Dr. Snow administered amylene. He took it quietly, and was unconscious in about two minutes; when he was turned on his side for the operation he became convulsed for about

* The first case of death from amylene occurred in England, April 7th, 1857, and was related by Dr. Snow in the *Med. Times and Gaz.*, of that year, vol. i. p. 379. There was no smell of amylene in the body after death. It is quoted by Casper (l. c, vol. ii, p. 283),

a minute. A little more amylene was given, and the tumour removed in about two minutes; but he did not appear absolutely unconscious. As soon as the operation was concluded, the limbs became relaxed and the breathing more stertorous; and no pulse could be felt. He quickly became livid, and his breathing gasping. Artificial respiration was resorted to, and spontaneous acts of inspiration occurred during the insufflations. The Marshall-Hall method was kept up for about $1\frac{1}{2}$ hours, and during the first half-hour there were some attempts at respiration. No pulse could, however, be at any time felt. Galvanism was also resorted to over the chest, and finally by means of needles stuck into the heart's substance; a slight quivering of the pectoral muscles attended their insertion. The patient died.

Post-mortem examination twenty-three hours after death.—*General appearances.* The face and depending parts of body were very livid. The rigor mortis present.

Cranium. Scalp congested. Surface of brain rather pallid. A slight amount of fluid existed in the lateral ventricles. Brain healthy.

Spinal cord. This organ was natural.

Thorax. The heart's substance was rather pale and soft (perhaps from decomposition), but not fatty under the microscope. The needles had well penetrated into the walls of the right ventricle. The cavities on both sides contained a moderate amount of dark fluid-blood. The lungs were congested, and some small patches of extravasation existed in its substance. Over the surface of the left lung were two or three small tumours, in appearance like those removed from the back.

Abdomen. Excepting a cyst of one kidney, which contained much calcareous matter, the various organs were natural.

The blood throughout the body was fluid, and no odour of amylene existed. [186.]

It will be noticed that in the above cases of death from chloroform and amylene, and also in the case of opium-poisoning, galvanism was resorted to, in some cases this being applied directly to the walls of the heart. It is only right to say that some authorities look upon its use in suspended animation as injurious, and calculated to retard resuscitation. Thus Dr. Snow stated his belief in one of his pamphlets on chloroform and anæsthetics, &c., that when the heart's action had been arrested by chloroform, he had never been able to restore animals by electricity. Dr. Richardson also read a paper at the British Association at Manchester in 1861, in which, referring to the question whether galvanism could be used to start the respiration, or to start the heart after it had been stopped, he stated that he had come to the conclusion, that although it

might be made to induce respiration by directing the current in intermittent shocks through the chest, from the larynx to the diaphragm, yet that the muscular exertion it produced exhausted the muscular force more quickly than the mere rest or natural death of the muscle. Dr. Richardson showed how necessary it was in cases wherein the respiration had ceased; the influence of artificial respiration in restoring the failing heart is materially increased by making use of air heated to 130° Fahr. He suggests that, in receiving-houses for persons drowned or accidentally killed, a hot-air bath should be always kept ready, in which the patient should be at once placed, and the air of which should be used for artificial respiration.

I would observe how desirable it is for our Hospital, and all other hospitals, to have a chamber or room heated by hot-air, after the manner of the Roman or so-called Turkish bath, not only for sweating people in rheumatism, kidney-disease, dropsy, &c., but also for the purpose of performing artificial respiration in a more efficient manner, &c., in cases of poisoning.

In the article on chloroform in the French dictionary already quoted are noticed the observations of Duméril and Demarquay on the lowering of temperature in animals under the influence of anæsthetics. Billroth thought this was owing to loss of blood; but E. Boeckel found by experiment on rabbits and pigeons that whenever the action of ether or chloroform was pushed so as to render the eyeball insensible, the temperature fell at least two degrees, and continued to fall for some time after the inhalations were suspended. He suggests that this lowering of temperature results from saturation of the blood-globules by chloroform, by which the absorption of oxygen, and therefore the oxydations which are the source of animal heat, are prevented. Possibly also there is a direct action on the nerve-centres and vaso-motor nerves.

II. INORGANIC POISONS.

CASE XVII. *Poisoning by arsenic and opium.*

Peter W., æt. 40, was admitted September 24th, 1844, at 11 P.M., supposed to have taken poison at 12 A.M. He vomited a quantity of fluid like coffee. Two empty ounce bottles, smelling of laudanum,

and a parcel containing arsenic, were found near him. Two scruples of sulphate of zinc did not excite vomiting. He was capable of being roused when sharply spoken to, and answered questions, but soon dozed off again; breathing was slow, but quiet; the pulse weak; and the skin cool. The face was pale and unexpressive, the pupils contracted and sluggish. The stomach-pump was used, and much acid greenish fluid was brought up. A mustard emetic proved useless. He became sensible, so as to give his address when roused. At 1 A.M. his extremities were cold, the pulse scarcely perceptible, the breathing slow and stertorous. An hour later, he was quite insensible; there was much stertor, and he was incapable of being roused. The pupils were contracted to the size of a pin's head. He continued in this manner, with puffing of the cheeks on expiration. The pulse gradually failed, and he died at 5.45 A.M.

Post-mortem examination.—Thorax. The lungs were congested posteriorly. The coagula of the heart's cavities were loose, specially on the left side, where they were very small, and partly fibrinous.

Abdomen. The stomach was rather congested, and coated by thick dark tenacious mucus, but nothing more; it contained arsenic in decided quantities, its surface being covered by little black specks, among which might be seen minute bright specks of a whitish colour; the other organs were natural.

Cranium. Much blood existed in the longitudinal sinus and also in other cerebral veins. A small amount of clear subarachnoïdean fluid existed. There were two patches of ecchymosis, one on either side of the superior fissure of the brain, in the pia mater: under these patches the brain was more vascular than in other parts, and very injected. Otherwise it was natural. The ventricles were small, and contained a slight amount of clear fluid. [209.]

CASE XVIII. *Poisoning by caustic potash. Contraction of the œsophagus and pyloric end of the stomach, &c.*

Elizabeth G., æt. 44, was admitted May 2, 1853, one hour and a half after swallowing a quantity of American potash (an impure caustic alkali). She had vomited immediately after taking it, and the mouth and fauces were very corroded. On introducing the stomach-pump small shreds of softened membrane were found clinging to the tube when removed. Great pain was experienced in the region of the stomach and the course of the diaphragm, and leeches were applied to the throat and epigastrium, and laudanum given every few hours, with suitable diet. On the following day, as the bowels had not acted, the mixture was changed for one containing sulphate of magnesia and antimony, and leeches were again required and purgative enemata. On the 4th, vomiting came on, but the pulse continued quiet as before; there was some dysphagia and pain at the top of the sternum, but no tenderness or pressure at the epigastrium was complained of. Enemata were repeated; and she much improved, the vomiting having ceased for several days. On the 9th there was some dysphagia, and the mouth and fauces were very abraded; and on the 15th, as tenderness at the

epigastrium was complained of, a blister was applied at that part. The pain at the stomach became very great, and opium in 1-grain doses was given night and morning, and purgative enemata continued. Subsequently the pulse became quickened, the tongue shiny and glazed, the sickness and abdominal pain continuing. On the 8th of June another blister was applied to the abdomen and thigh; the abdominal pain remained very severe; the mouth and throat improved under the use of local applications. Nothing remained on the stomach, and the bowels only acted by enemata, and nourishment was given by the rectum entirely. She, however, died, apparently from inanition, July 8th.

Post-mortem examination.—The body was very emaciated. The organs of the thorax were quite natural, and the tongue, fauces, and pharynx were found in a natural state; but at the upper part of the œsophagus, opposite the cricoid cartilage, three distinct cicatrised bands were observed, contracting the mucous membrane, being apparently the remains of former ulceration. The lower part of the œsophagus was much contracted, its lining-membrane quite destroyed, and the muscular coat exposed. The external tissues were very thickened, owing to effusion of fibrine, and the tube was very adherent to all the neighbouring parts. The cardiac orifice of the stomach (where ulceration ceased) was so contracted as barely to admit the passage of a director. The mucous membrane at the pyloric end of the stomach presented a large and dense cicatrix, which involved the chief parts of the circumference of the orifice, implicating the valve, and quite obstructing all communication with the duodenum, excepting by means of a small orifice which only admitted an ordinary-sized probe. The other part of the stomach was healthy. The remainder of the intestinal tubes was healthy, as were all the other abdominal organs.* [142.]

CASE XIX. *Chronic poisoning by caustic potash; cicatrices of the stomach, and contraction of the pylorus.*†

Charlotte R. was admitted Sept. 20, 1853, complaining of much vomiting and weakness. Some weeks before, having been greatly frightened, and thus rendered unconscious, she had something given to her to drink, which she said was hartshorn. Immediately after drinking it, she had pain in the stomach, and about an hour afterwards was sick, and vomited blood; and this continued three days. Ever since then almost all food had been rejected. Gradually she improved; but still exertion made her vomit food which had been swallowed. The bowels on admission were costive, and she was quickly losing flesh. Under the use of effervescing salines and purgatives she much improved, and steel was eventually given. Later on, a distinct fulness under the left hypochondriac was noticed, which was probably from distension, as

* Preparations of the diseased œsophagus and stomach are in our Museum. See Series ix. Nos. 19 and 204.

† As this case, as well as the previous one No. X., have been related by Dr. Barclay in the *Med. Times and Gaz.* vol. ii. p. 553, for year 1853, I have only given a general outline of them.

it disappeared when vomiting returned. She sank, and eventually died (Sept. 30) from inanition.

Post-mortem examination.—*Thorax.* The lungs were healthy. The heart small, but healthy.

Abdomen. The stomach was distended, and contained a quantity of grumous fluid. The œsophagus was healthy, but the cardiac orifice of the stomach slightly contracted. A large and dense cicatrix occupied the inner surface of the posterior wall of the stomach to the extent of half-a-crown, and from its margin many dense fibrous bands diverged in different directions over the posterior wall, those near the pylorus being larger and more distinct. The pyloric orifice itself was contracted to the size of a crow's-quill, and the tissues surrounding it, for at least an inch in extent, were dense and thickened. The intestines and other organs were all healthy.* [201.]

In connection with this and the former case, I would refer to some out-patient cases which I published in the *Medical Times and Gazette*, in which symptoms of contraction of the œsophagus resulted from swallowing potash.

CASE XX. *Poisoning by sulphate of zinc. Lungs congested; peculiar state of the mucous membrane of the alimentary canal.*†

John Walker, æt. 45, was brought in quite dead, January 10th, 1850, having died on the way to the Hospital. He had rather a superficial wound of the throat, which had apparently been inflicted some time. He had been a hard drinker, and attempted self-destruction twice previously. He often took laudanum on his own account; it was said for delirium. He often used sulphate of zinc as an application to his eyes, and on one occasion had observed to some friend that he had enough to poison a large number of men. During the whole week before he cut his throat he was very ill and vomited, and scarcely seemed to know what he was about. The evening before his death he was very excited, tremulous, and apparently delirious. About 11 p.m., after taking some brandy, he became very sick, and went to bed. The next morning his room was broken into, and he was found scarcely able to speak, with his throat cut. He refused to have the wound dressed, and was violent; and, as was said, he died on his way to the Hospital.

Post-mortem examination.—The wound of the neck only involved the integument and muscular fibres, no vessels or nerves having been divided.

Thorax. The lungs were greatly congested. The heart was natural,

* Preparations of the stomach and duodenum are in our Museum. See Series ix. p. 201.

† This case I have already related in the *Lancet* for 1859, vol. ii. p. 210; and preparations showing the diseased stomach are preserved in our Museum. See Series ix. No. 198.

the left ventricle contracted, the other cavities containing dark blood. The blood met with generally was very fluid.

Cranium. The brain was highly congested, and the sinuses of the dura mater and meningeal vessels much gorged with blood.

Alimentary canal. The lining of the mouth and fauces was of a white colour; the tongue was white and shrivelled. The mucous membrane of the epiglottis, pharynx, and œsophagus was slightly congested, and the surface thickened in patches, and of a grayish-white colour. The stomach was contracted, containing 1 oz. of whey-like fluid; and almost its entire surface was of a grayish colour, the mucous membrane being thickened and indurated, and vascular, and having much the appearance of tripe. The lining of the small intestines was very vascular, and at the upper part was of the same gray colour as the lining of the stomach, though to a less degree. The colon and rectum were very contracted, and smeared over by a curdy substance; their coats were, however, healthy. The intestines contained no fæcal matter. The kidneys were congested, the bladder contracted. Other organs were healthy. [32.]

CASE XXI. *Poisoning by perchloride of mercury (corrosive sublimate).*

Partial paralytic symptoms. Thickening and ulceration of the stomach; colon and part of ilium coated by soft fibrine.

F. L., æt. 45, was admitted February 27th, 1842, having swallowed a quantity (about 5ii) of corrosive sublimate shortly before, spread on bread-and-butter. This made him so sick that he was unable to swallow more. The stomach was well washed out by the stomach-pump, and but slight pain at the pit of the stomach resulted. On the following day the mouth had become very sore. On the 1st of March the tongue was brown and furred, and the patient complained of giddiness and dimness of sight. *The mouth was drawn to the right side, and power was apparently lost over the left upper eyelid.* The patient was in no pain but had passed a certain amount of blood by stool. On the 2d he passed much more blood, and was profusely salivated, but was in no pain. On the 3d he still complained of no pain or abdominal tenderness, but of much weakness and giddiness, and had partially lost power over his tongue. On the 4th the gums began to slough, he became drowsy, and passed much watery fæces. He died in the evening, having lived six days after taking the poison.

Post-mortem examination.—The gums were found in a sloughy state, and the parotid and submaxillary glands very injected.

Cranium. The contents were natural.

Thorax. The pleural sacs were empty; slight bloody ecchymosis existed beneath the pleura at the lower parts of the lung. The lungs on section proved to be very full of frothy serum. The heart was natural.

Pharynx. The mucous membrane was unusually red, and recently-formed fibrine covered the posterior part of the epiglottis and the mucous membrane between the internal surface of the alæ of the thyroid cartilages and the vocal chords. An old ulcer existed on the tonsil. The œsophagal mucous membrane was very red in patches.

Abdomen. The whole of the mucous membrane of the stomach was very red, and about three inches from the cardiac orifice was a black sloughy patch of the size of half a penny, irregular and with sharp edges. The walls of the stomach in the neighbourhood were much thickened, and the surrounding sub-mucous tissue very discoloured. Two small and similar patches existed also in the neighbourhood. The duodenum was very vascular, and the lower three feet of the spleen, highly congested, of a black colour, and coated by recently-formed fibrine. The whole of the colon and rectum was lined by soft fibrine, and its submucous tissue was very thickened. Other organs natural.* [245.]

In the above case the paralytic condition of the upper eyelid (ptosis) and the facial paralysis are specially worthy of note. These particular symptoms in connection with the use or abuse of mercury I have not anywhere found described, though of course the mineral affects remarkably the cerebro-spinal system,—this is shown by the muscular tremor often set up by it (tremor mercurialis), the neuralgia, and sometimes, in acute poisoning, coma, and sometimes convulsions and paraplegia. In the second volume of the *Memoirs of the Medical Society of London* mention is made of total blindness and impairment of the understanding being occasioned by the use of mercury; and also of symptoms like lead-poisoning being produced by arsenic; and of paraplegia from the use of antimony. Metallic paralysis was recognised before the present medical era, so to say, and is mentioned by Bonetus in his *Sepulchretum*, tome i. p. 359. I have lately seen a gentleman from Antigua, who had been poisoned by “sugar-of-lead.” After the immediate symptoms had passed away, numbness of both feet existed for four weeks; but he did not notice that the motor power of the legs was affected. He could not, indeed, walk with certainty, but attributed that to deficient sensibility of the skin of the soles of the feet. There was also slight numbness of the skin of the fingers. The sphincters were unaffected. No blue line had been caused by the use of the lead, as I have sometimes seen produced.†

* Preparations of the diseased organs in this case are preserved in our Museum. See Series ix. Nos. 10, 36, 113, 114, 199.

† The following case of poisoning with ammonio-chloride of mercury and laudanum, which was supplied to me by Dr. Bence Jones, though not fatal, is worthy of record, as attempts at suicide by such poisons are rare:

Mary B., æt, 18, was admitted March 22, 1843, between eleven and twelve

CASE XXII. *Poisoning by perchloride of mercury (corrosive sublimate). Corrosion of the œsophagus and the stomach; peculiar condition of the large intestine.*

Thomas J., æt. 44, a butler, of intemperate habits, was admitted May 17th, 1862, at 9 A.M., having at 6 o'clock swallowed a table-spoonful (it was said) of corrosive sublimate in a teacup of vinegar. In an hour's time after taking the poison he began to suffer from severe pain in the œsophagus and epigastric region; also purging and vomiting came on, and the material vomited and passed by the bowel was mixed with blood. Eggs and milk were given, and he was afterwards brought to the Hospital. On admission, his face was of a dusky leaden colour, and his expression was very anxious; there was much tremor of the lips and limbs. There was no pulse, and the skin was very cold; the articulation was difficult. Constant vomiting and purging went on. After brandy, opium, and ammonia had been given to him, he rallied. Ice was applied to the stomach, and subsequently warm fomentations. On the following day he was better, the purging was less, and there was no pain; the pulse had become quite natural. Later, however, hiccough came on, and the purging returned. Collapse set in, and he died sixty hours after taking the poison.

Post-mortem examination.—*Thorax.* The lungs were emphysematous. All the cavities of the heart were found to contain large blood-coagula. The upper part of the œsophagus was natural.

Abdomen. The lower part of the œsophagus was of a rusty colour, and nearer to the stomach it was corroded. The mucous membrane along the great curvature of the stomach presented many dark lines more or less parallel, showing the charring effect of the poison on the prominent folds. These were more dark towards the pylorus, close to which the surface was roughened and eroded.* The upper five inches of the duodenum was of a rusty colour, and beyond this it was soft and

o'clock at night, having taken about ten o'clock twopennyworth of "white precipitate," and near upon a wine-glassful of laudanum, going shares with another person. The white powder was taken in gin.

Immediately after, about three minutes, she felt a burning at the chest and throat. She said the powder tasted like chalk. About half an hour afterwards she had a dreadful pain in the inside across the bowels, and got very sleepy; could scarcely walk, she felt so bad. It seemed to take the use of the limbs away. Then felt very sick: was actually sick in the street going home, being led; when at home, had much retching, but was not sick. The pain in the inside was very great; says she was nevertheless quite stupefied. After being at home a quarter of an hour, she was brought here in a cab, having been sick once. The stomach-pump was applied and white of egg given.

23d. Complains of little pain at the pit of the stomach. Has not been sick. Slept tolerably. No distress.

24th. Says that on taking food she feels a burning at the chest and in the throat. No other complaint. To go home.

* Preparations of the diseased stomach and intestine in this case are preserved in our Museum. See Series ix. Nos. 337 and 338.

swollen. All through the small intestine below this point the surface was covered with a fine white powdery deposit, which could not be removed. The valvulæ conniventes of the lowest part of the ilium were of a yellow-and-brown colour. The whole of the large bowel was coated by a thin layer of an elastic material adherent to the bowel like india-rubber, and showing every fold and ridge, and having the smell of fæces. On stripping this off with difficulty, the mucous membrane beneath was found rough and congested.

Cranium. The brain was watery, and more than usual fluid was found in the subarachnoid spaces. [137.]

CASE XXIII. *Poisoning by hydrochloric acid. Sloughing of the stomach and œsophagus.**

Joseph G., æt. 25, was admitted October 31st, 1836, reported to have swallowed 2 oz. of hydrochloric acid two hours before admission. He had vomited some dark-green matter which effervesced on the addition of carbonate of soda. The skin was warm, the pulse 58 per minute, and small; the tongue dry and excoriated. He had vomiting, and, later on, great soreness of the throat and fauces was complained of, with pain at the epigastrium, and dysphagia. In spite of treatment, the patient sank, and died November 8th.

Post-mortem examination.—Thorax and neck. The mucous membrane of the larynx and bronchial tubes was very inflamed, and the lungs were hepatised.

Abdomen. Portions of the inner surface of the œsophagus were in a sloughy state, and the stomach, especially about the pylorus, was also very sloughy, large dark shreds of the slough hanging down from the surface.† The duodenum was very inflamed, but not sloughy.

CASE XXIV. *Poisoning by sulphuric acid. Discoloration and in part destruction and charring of the mucous membrane of the stomach and duodenum, &c.‡*

Thomas H., æt. 33, was admitted May 4th, 1853, in a state of collapse. He was a gentleman's servant, who had lost money by betting. He had been observed to fall in the street, and was at once conveyed to the Hospital, where it was ascertained that he had taken "vitriol." The lips and also the fauces were corroded; and when the stomach-pump was used, shreds of mucous membrane were brought away with the tube. He sank, and died in about nine hours' time.

Post-mortem examination. The body was very laden with fat, and much turbid yellow fluid ran from the mouth. The lips and part of the chin were charred and desiccated.

* This case has been described in the *Medical Gazette* for 1836, vol. xix: p. 349.

† The stomach is preserved in the Museum as preparation No. 200, Series ix.

‡ This case I have already described in the *Pathological Society's Transactions*, vol. xi. p. 294; and the diseased œsophagus and stomach are preserved in our Museum; see Series ix. Nos. 11 and 206.

Abdomen. The surface of the ilium was very discoloured, being in places of a pink or of a greenish colour. The under-surface of the stomach was of a streaky pink hue, the dark veins shining through this. The stomach contained half a pint of very acid reddish-coloured fluid; a large amount of its lining-surface was but little affected, being of a slight rose-colour; but in many places, especially along the smaller curve of the viscus and around the pylorus, the mucous membrane was destroyed, having a black and charred colour, and in other places it had a dark reddish-brown colour. The summits of the folds of mucous membrane were in many cases of the same character, and the inner surface of the duodenum to a great extent was roughened and hardened; the glands in the neighbourhood being very prominent. Nowhere was the muscular coat exposed.

Œsophagus and tongue. The tongue was but slightly affected. The fauces were very vascular; the entire length of the Œsophagus was also very vascular, and in places, especially along the posterior part of the tube, very dark in colour. At its upper part shreds of firm white membrane were found attached loosely to the surface. These consisted of debris of mucous membrane and great numbers of nuclear bodies. The epiglottis and mucous membrane of the glottis and of the tongue were of a pink colour, and slightly thickened.

Thorax. The lungs were congested, but nothing more was noticeable about the thoracic viscera. [97.]

The dark colour of the coats of the stomach is explained by the destructive action of the acid on the capillaries, whence arises extravasation of the blood which comes in contact with the acid. Casper found by experiment on the dead body that sulphuric acid does not produce the above effect; the colour remained of only a light grayish black, owing to the absence of extravasation of blood. He always found a remarkable antiseptic action produced in sulphuric-acid poisoning, the bodies remaining long fresh and giving out no ill smell on dissection. This he attributes to the neutralising by the acid of the ammonia arising from the putrefactive process.

JOHN W. OGLE, M.D.

XVII. ON THE TREATMENT OF WOUNDS BY THE APPLICATION OF CARBOLIC ACID, ON LISTER'S METHOD.

SHOWING THE RESULTS OF A SERIES OF CASES SO TREATED IN THIS HOSPITAL DURING THE LAST FEW MONTHS.

WE propose, in the following paper, not to offer any observations on the theoretical reasoning upon which Mr. Lister's proposal rests, but simply to relate, as briefly as possible, the results of its application in the practice of one of the surgeons of the Hospital* and in the out-patient room. The results, it is true, are not in themselves striking; nor can we affirm decisively that they are better than would have been attained under the ordinary methods of treatment. Erysipelas, pyæmia, diffuse cellular inflammation, and tetanus—those formidable complications of wounds which we hoped to banish by the adoption of this method—have, as it will be seen by the sequel, claimed their proportion, and not a very small proportion either, of the number under treatment. Yet we do not on that account intend this report as being at all condemnatory of the method. There may have been causes, not as yet clear to us, why we should have been less successful than Mr. Lister and others have been. We can hardly think that the cause can lie in any imperfection in our method of carrying out Mr. Lister's directions, for they are in themselves exceedingly simple and clear; and until we had become perfectly familiar with the minutest details, we kept before us the paper in which Mr. Lister described them.† Wishing also to give the method its fair trial, we have never

* With the exception of one or two cases, all those treated as in-patients were under Mr. Holmes's care.

† *Lancet*, or *Brit. Med. Journal*, Sept. 21, 1867.

deviated in the least degree from the plan which, in the paper referred to, is spoken of as so successful. It may easily be, however, that better results would be obtained if (as is probably the case in Mr. Lister's wards at Glasgow) all the sores in the ward were dressed with this substance. It is impossible to resist the conviction that there is some merit in Mr. Lister's suggestions when we see how quietly and well large wounds will sometimes go on, under his treatment, without being exposed for weeks; and also how little fœtor there is about the discharge when it soaks from under the dressings. We can hardly avoid concluding that if every wound in the ward were thus deodorised, the atmosphere of that ward would probably become more healthy, and all the wounds would be more prone to rapid union.

The cases on which this paper is founded are forty in number, divided into compound fractures, lacerated wounds, incised wounds (including surgical operations), abscesses, and lastly burns and scalds. The cases which we have so treated have been more numerous, but of a good many of them no notes have been preserved. None of these, however, as far as our recollection serves, have been of any striking importance one way or the other. We shall offer abstracts of most of the cases, referring more summarily to those which do not appear to merit special notice.

Compound fractures.—Our list comprises, in the first place, eight cases of compound fracture. In one, and that the first case in which the treatment was tried at St. George's (No. I.), there can be little hesitation in saying it did harm, and that the swelling of the parts caused by blocking up the wound had much to do with the access, and with the rapidity, of the gangrene which ensued. On the other hand, in Case VII. the treatment appeared to succeed admirably; for a limb, which most of those who saw the case considered it a little quixotic to endeavour to save, was healed without even the minutest indication of surgical fever. Out of these eight cases three can hardly be said to have been treated entirely on Lister's plan (Nos. III. IV. VI.), since the wound was not mopped out, but merely covered with the carbolic dressing; yet it is remarkable that two of these were the only instances

in the series of the transformation of the compound into a simple fracture.* Case VI. bears a striking resemblance to one reported by Mr. Lister in the present No. (Oct. 31) of the *British Medical Journal*, where, he says, he ventured to produce a compound fracture because he knew he could convert it into a simple one by carbolic acid; and in that case also it appears that the wound was not mopped out, but merely covered. In our patient the fracture was so nearly compound that it was judged better to liberate the tension of the parts at once, and remove the fragment sticking into the skin; but the result of the case will prove that carbolic acid alone, without good general health and sound viscera, is not an efficient safeguard for the healthy union of a wound.

On the whole, we must allow that our experience of the advantages of this method of treatment in compound fracture is as yet negative. But enough has been shown to prove to us that the method, if cautiously used and well watched, does no harm; and that in compound fractures which it seems desirable to seal up, there is at any rate a fair prospect of union of the wound, if the sealing is effected by this dressing. In such cases, if the wound is small, it seems to us decidedly better not to interfere in any way with its cavity.

CASE I.—John Staddon, æt. 18, admitted Nov. 1st, 1867. Lacerated wound of foot from catching the foot in the turn-table of a railway: much laceration and bruising of the soft parts, with slight fracture of the os calcis or superficial wound of that bone; considerable hæmorrhage. The wound mopped out and dressed most accurately, according to Lister's directions, about five hours after the accident. The wound went on badly—the parts over the external malleolus sloughed, from tension and the pressure of a splint which had been applied there. The extent of mischief led to the proposal of amputation on the sixth day, but this was refused by the patient. There was now a blush of inflammation spreading up the leg. The carbolic-acid dressing was given up, and the parts liberated by free incision. Ultimately the patient desired amputation, and it was performed; but not till after he had had some suspicious symptoms; and he died of pyæmia.

CASE II.—Frederick Oliver, æt. 8. Compound fracture of the skull, May 5th, 1868. Wound of forehead about $1\frac{1}{2}$ in. in length; contused, but not to any great extent; a portion of bone exposed about three-quarters the size of the wound; a small fissure could be seen running across the

* It is not clearly stated in Case II. whether the wound was mopped out or not: my impression is that it was not. T. H.

exposed bone, out of which blood was exuding. He was conscious, but had slight convulsions soon after admission. There was some little difficulty in keeping the lint on his head, and it dropped off on two occasions. No general symptoms ensued. A slight purulent discharge exuded under the dressings, which were finally removed on the thirteenth day, and the wound treated with water-dressing. He left the Hospital on the eighteenth day after the injury.

CASE III.—John Clampit, æt. 35. Admitted June 30th, 1868, with a compound fracture of the tibia and fibula; the latter bone comminuted. The wound was very small. The case was treated by the application of the oily solution of carbolic acid and the paste over it, but without any sponging of the wound with pure acid, and it did very well, the wound having nearly healed in a week; and when the dressing was finally removed, being found to be scabbed over.

CASE IV.—Robert Bentley, æt. 22. Admitted July 23d, 1868, with compound fracture of the leg, near the knee-joint. The lower end of the upper fragment of the tibia had pierced the skin. There was a small comminuted portion, but this was allowed to remain. The wound was covered with the dressing (but not mopped out). On August 17th the dressings were removed, and the wound was found to be healed with a scab. The case did perfectly well.

CASE V.—William Deacon, æt. 48. Admitted August 19th, 1868, with compound fracture of the leg about two inches above the ankle; the tibia protruding. It was reduced with difficulty; the wound mopped out with carbolic acid, and dressed according to Lister's plan. He died on the fourth day after the accident; his death being attributed to "pyæmia," though no secondary deposits were formed, nor was any morbid appearance noticed about the veins. The kidneys were diseased, and he had suffered from slight symptoms of delirium tremens.

CASE VI.—William Jackson, æt. 46. Admitted October 18th, 1868, with a fracture of the fibula, communicating with the ankle-joint. A fragment stuck into the skin, though not entirely through it, and could not be moved. A small incision was made on this; the pointed portion of the fragment removed, and the skin thus liberated from tension united with a stitch, and covered with the carbolic dressing (no sponging out of the wound). Diffuse inflammation, with profuse suppuration and gangrene of a portion of the skin, followed. Amputation of the thigh was performed on the fourteenth day.*

CASE VII.—John Ruff, æt. 41. Admitted December 12th, 1867, with compound fracture of the leg. There was a large wound on the inner side, from which a fragment of the tibia protruded for more than two inches; the parts could not be got into position. The protruding portion was sawed off, as was also a piece projecting from the lower frag-

* This patient died of pyæmia. He had diseased kidneys, and had been of drunken habits.

ment, and comminuted portions of the fibula were removed, making up a piece of that bone corresponding in length to the part of the tibia which had been removed. The wound was dressed on Lister's plan strictly. There was no rise of the pulse or temperature, which were carefully noted for a week after the accident. The wound was not exposed till the thirty-first day, when it was found covered with healthy granulations and discharging a small quantity of matter. There was a small surface of bone exposed; but this became covered as the case progressed. The carbolic-acid dressing was reapplied, and kept on for about three months in all. In five months the limb was pretty firmly united, with about three inches of shortening; and the wound was almost healed.

CASE VIII.—Thomas Aldridge, æt. 25. Admitted Jan. 14th, 1868, with a lacerated wound of the hand, with fracture of one of the metacarpal bones. The wound penetrated the hand. It was treated by sponging out the whole wound and applying Lister's dressing to both orifices. This was eight hours after the accident. On the 21st acute tetanus came on, the symptoms appearing about 11 A.M., and he died at 4 o'clock in the morning.*

Lacerated wounds.—The next class of injuries on our list is lacerated wounds—the wounds made by accident, and admitted into our Hospital in consequence, either as in- or out-patients. The number of cases in this class is 15; but we have not thought it necessary to subjoin notes of all of them. Only one out of the whole number united by first intention. Attention may be specially directed to the fact, that out of the whole series the case in which the most striking benefit was apparently derived from the treatment was one (No. XI.) of a granulating wound inflicted ten days before.

CASE IX.—James Airey, æt. 16, admitted Nov. 15th, 1867. He had caught his left arm in some machinery in motion. There was simple fracture of the forearm and a lacerated wound of the hand, exposing the palmar fascia for a considerable extent, and the origins of some of the short muscles of the thumb, which protruded through the skin. The wound was dressed strictly on Lister's plan, and was not exposed for seventeen days. At first there seemed to be considerable collection of matter, and it was apprehended that a counter-incision would be required. This, however, disappeared with the formation of an opening at the back of the hand, from which much bloody pus escaped. The wound did very well; and he was discharged on December 11th with very good use of the hand, though the thumb was somewhat stiff.

* This was the patient whose case is reported by Dr. Dickinson in the 51st vol. of the *Med.-Chir. Trans.* as to the condition of the spinal cord in tetanus.

CASE X.—Thomas Giles, æt. 27, incised and lacerated wound of leg, Nov. 15th, 1867. Dressing applied immediately after admission. Time after injury not stated. Precise plan not stated further than "Lister's plan." No general symptoms. The wound was kept covered for seventeen days, a little pus exuding under the dressings. When the wound was exposed, the note is, "A healthy granulating wound was found, about what would have been expected if it had been dressed in the ordinary way." Discharged Dec. 15th.

CASE XI.—Jane Hardy, æt. 50, a large scalp-wound, about six inches long, not exposing the bone, inflicted ten days before, granulating healthily, Dec. 21st, 1867. A broad strip of plaster applied to support the flaps, and the wound dressed with the carbolic oil and paste. This was kept on for twenty-seven days, when the wound was found entirely united, except about one and a half inches at the angle.

CASE XII.—Alfred Bridges, æt. 16, lacerated wound of great-toe. Admitted January 9th, 1868. Dressed with the carbolic-acid paste, and wrapped in cotton-wool. The wound was left untouched in any way for fifteen days, when it was found granulating healthily. He made a good recovery.

CASES XIII.—XXIII.—Besides these, Mr. Holdernessee has preserved records of three cases of lacerated wound among the in-patients, and eight cases of scalp-wound amongst out-patients, treated by this manner. Of the whole number, only one (of the latter class) united in first intention. But they all did well ultimately.

Incised wounds.—The method has had a fair trial in surgical operations and in incised wounds accidentally inflicted. As an immediate application to the wound of an operation, it has not seemed to succeed. It appears to stimulate the parts, and to excite a certain amount of oozing of blood, by which the cavity of the wound is distended, and which afterwards breaks down, excites suppuration, and prevents immediate union. Whether it would succeed better if applied after the wound had been allowed to glaze, we have not as yet tried. In fact, the obvious practical objection to this course after an operation is that it would necessitate the readministration of chloroform. Otherwise it seems a more promising method of applying the acid. The accidental incised wounds were in this condition, *i. e.* the acid was not applied to them instantaneously after their infliction, as in the surgical operations; and their results were good. Still they were of a class (in the hand and upper extremity) which is prone to rapid union.

CASE XXIV.—Wm. Miles, æt. 47, amputation of finger, Dec. 21st, 1867. Treated on Lister's plan. Dressings removed on sixteenth day. The wound then found not at all united, and a sloughy portion of tendon in it. It was then dressed in the ordinary way.

CASE XXV.—Ann Gould, æt. 51, amputation of the breast, January 16th, 1868. The wound was mopped out entirely with the strong carbolic acid, and the dressing applied over it. The dressing was removed eight days after the operation in consequence of a slight erysipelatous attack around the wound, which soon subsided on exposing the wound and dressing it with lotion of the muriate of iron. The greater part of the wound had united kindly. She was discharged cured on Feb. 5th.

CASE XXVI.—Henry Sewell, æt. 40, admitted July 28th, 1868, for a laceration of the foot, for which Chopart's amputation was at once performed. The arteries were twisted, except one, which could not be thus secured. It was commanded by acupressure, the needle being removed next day. The wound was mopped out, and dressed with the carbolic acid. The dressing was removed ten days afterwards for the first time; a portion of the stump (which had necessarily been formed out of injured parts) had sloughed, and the flaps had come apart. He had been subject to erysipelas of the face, and on August 14th erysipelas showed itself, first in the head and face, and then in the other leg, but the stump remained healthy. The case did well.

CASE XXVII.—Grace Bullock, æt. 51, amputation of the breast for scirrhus, Oct. 8th, 1868. The wound was about eight inches long. It was thoroughly steeped in the pure acid, particular pains being bestowed on the skin-edges; then over the sutures Lister's dressing was applied. On the 14th, as the under-dressing was completely soaked in discharge and loosened, it was removed, and the wound found bathed in pus. There was hardly any union, and the skin near the wound was abraded and excessively sore. There was, however, no fœtor about it. The wound was dressed in the ordinary way; and she made a rapid recovery.

CASES XXVIII.—XXXI.—Mr. Holdernes's book contains notes of four other operations in the Hospital in which this dressing was used. None healed by first intention. In one, a man of broken health, with diseased kidneys, died of pyæmia after amputation of the finger.

CASES XXXII.—XXXVI.—Five cases of incised wounds of the arm and hand were treated in this way in the O.-P. room. Three healed by first intention; two by granulation.

Abscesses.—Numerous abscesses have been opened, and the wounds dressed with carbolic acid; but the only cases of which we can find notes preserved are the three following. In all these the progress of the case was unusually favourable. Indeed, as far as our present experience justifies us in

pronouncing an opinion, we are more impressed with the benefits of Mr. Lister's suggestion in abscess than in any other class of cases.

CASE XXXVII.—Eliza Butt, æt. 27, simple abscess over the scapula, opened March 9th, 1868, and about half a pint of pus evacuated. The wound dressed with carbolic acid. On March 13th the incision was almost healed, and the discharge scarce perceptible. Simple dressing was used. The wound had healed on March 19th.

CASE XXXVIII.—John Callentt, æt. 32, strumous abscess of the right thigh, opened March 24th, 1868, and dressed with the carbolic acid. The dressing was removed on April 9th, and the wound was found quite healed.

CASE XXXIX. — James Brookes, æt. 18, bursal abscess of knee, opened July 3d, 1868, and dressed as before. The abscess gradually closed. Discharged July 30th.

Burns and scalds.—There remains one other case of which notes have been preserved, and of which we append an abstract, though it leads to no conclusion. In other instances of limited burn or scald, the carbolic-acid dressing has been found very useful as combating successfully the fœtor, which exercises so deleterious an influence on the progress of these cases, and being at least as favourable to rapid healing as any other application.

CASE XL.—Ehlen Brown, æt. 4, scald of legs, March 4th, 1868. Dressed with carbolic acid. No peculiarity noticed as to the healing of the wound. The case, however, did well.

So much for our experience hitherto of the local application of carbolic acid. It would have been more satisfactory to have been able to pronounce a positive judgment, and far more so if that judgment could have been unequivocally favourable—if we could have pointed to wards made more healthy and surgical complications no longer to be dreaded. This has not been the case in our practice; but at any rate the treatment has not proved either painful or dangerous, and we hope still for benefit from its further use and from trials of different methods of applying it.

T. HOLMES.

W. B. HOLDERNESSE.

PLATE I.

1.



2.



3.



4.



5.



6.

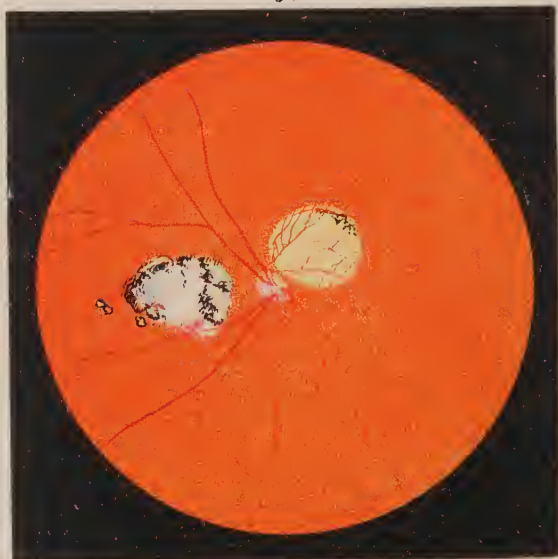


PLATE I.

FIG. I.

Case of optic neuritis.

FIG. II.

Result of exudation on retina, probably with detachment of retina
from the choroid.

FIG. III.

Result of exudation on retina, probably with detachment of retina
from choroid.

FIG. IV.

Result of hæmorrhage on retina, with atrophy of the chorio-capillaris,
and pigmentary deposit.

FIG. V.

Case of progressive myopia, with atrophy of the chorio-capillaris,
posterior staphyloma, and pigmentary deposit.

FIG. VI.

Posterior staphyloma, with remains of a hæmorrhage on the retina.



XVIII. OPHTHALMIC DEPARTMENT REPORT.

THE ophthalmic department of the Hospital, as at present organised, was opened for the first time on the 19th November 1867; and by the liberality of the governors, and with the consent of the medical officers, two wards, named Ratcliffe and Cholmondeley, containing nineteen beds for males and females respectively, were set apart for the exclusive reception of affections of the eye.

The out-patient days are Monday and Friday, and the time of attendance 9 A.M.

The absolute number of in-patients, from the 19th November 1867, to the same date of 1868, has been 195, of whom 95 were males, and 100 females. The total number of out-patients was 740, of whom 344 were males, and 396 females.

The tables appended to this Report will give a *résumé* of the nature of the cases under treatment.

The following cases, which have occurred either amongst the in- or the out-patients, have been selected as possessing special interest. The notes of the former have been kept by my clinical clerks, Mr. Christian, Mr. Lake, Mr. Lang, Mr. Walker, and Mr. Norman; those of the latter I have kept myself, and I can only regret that in many instances they should have been so fragmentary.

Plate I. fig. 1, represents a case of optic neuritis, occurring in a woman who presented herself at the Hospital on July 11, 1868, with the following history:

About a year previously she had been greatly distressed by the death of her husband, who fell from a scaffold. She had cried so much that her sight became impaired. After some time she went out as a servant in St. John's-wood. One evening in November she was sitting in the

house alone, after having been engaged in cleaning all day, drinking her tea, when she heard a rustling as of a silk-dress, and on looking up she saw the figure of a young woman glide in, who stood before her long enough for her to notice every peculiarity of the dress, and then vanished suddenly, without giving her time to address it. She was greatly discomposed at this apparition, and immediately rose from her chair, walked across the kitchen, was very sick, returned to her seat, felt giddy, and fell against the grate. On awaking from her state of unconsciousness, she felt her arm and side grizzling against the bars. She raised herself with great difficulty, and fortunately a friend came in to see her, and she was immediately placed under medical treatment. From that time to the date of her coming to the Hospital, her vision had been failing to a marked degree. She was not an unhealthy-looking woman, but she complained of frequent pains in the head, of a feeling of sickness, and of fearful dreams. Her memory had failed; though when she determined to think over a past event, she could reproduce it in her mind vividly enough. Some years previously she had suffered from inflammation of the uterus, and had been treated for it at St. Mary's. When she laughed, violent pain came on over the brow and top of the head. She often experienced a burning sensation in the head, leading her to apply wet cloths. The pupils were dilated, and there was a lack-lustre appearance about the eyes. Gaslight and sunlight were painful to her. There was no palpitation, nor was there any cough. She frequently had singing in the right ear. With the right eye she could just decipher No. 12 of Snellen; with the left she could read it with facility. On examination, the media of both eyes were found to be perfectly clear; the optic discs hyperæmic; the surface tumefied, and softly shaded; the margins very indistinctly defined, surrounded, especially below, by a gray halo; the middle point whiter than the rest; the vessels of moderate size, becoming gradually lost towards the centre of the disc, evidently owing to their plunging into a semi-opaque tissue. Though the vision was worst in the right eye, the disc was whiter and better-defined than in the left, which is the one represented in the drawing. She was ordered decoct. of cinchona and a drachm of the solution of the bichloride of mercury. Under the influence of the mercury considerable improvement occurred, so that in the course of two months she was able to see No. 2½ with the left eye, and No. 8 with the right, and she ceased to attend.

November 10th. Since writing the above, this patient has been readmitted in consequence of her having suffered from a fit, which was described by her friend as being attended with loss of consciousness and by considerable rigidity of all the limbs, though there was little or no convulsion. No marked change has occurred in the condition of the optic discs. The symptoms upon the whole seem to point to the formation of a tumour in the brain, and it is not unlikely that the further history of the case may be given in the Report for the following year.

The next case I shall mention is one which presents several features in common with the foregoing.

E. S., æt. 25, came to the Hospital Oct. 7th, complaining of increasing dimness of vision. She stated that three years previously she had suffered from a severe attack of syphilis, lasting one year; and six months before had been delivered of a child, which died after one week. Her delivery and subsequent recovery occurred under circumstances of much privation and mental distress. About a month previously, on the occasion of the festivities attendant on Lord Bute's coming of age, she worked for two or three nights continuously in the kitchen at Cardiff House, exposed to a hot fire, for the greater part of the time without sleep. On examination, the pupils were found widely dilated, and scarcely acted under the influence of light. She could read Snellen's No. 30 at ten inches. There was no intolerance of light, but much pain in the brow and temple. With the ophthalmoscope it was observed that in both eyes inflammation of the optic nerves was present, the margin of the discs being obscure, passing insensibly into the surrounding tissue, the surface tolerably smooth, and uniformly pink. The retinal vessels of moderate size, tortuous, becoming fainter, and ultimately lost as they approached the centre of the disc. The foveæ centrales distinctly visible. In the left eye there was a slight speck of ecchymosis near the lower margin of the disc. No albumen was present in the urine. She was ordered to be kept in a darkened room, to have a blister on each temple. Decoct. cinchon. $\mathfrak{z}\text{j}$. liq. hyd. bichlorid. $\mathfrak{5}\text{j}$. ter die, and ordinary diet, with beef-tea.

On the 12th Oct. considerable improvement had taken place in the vision, as she was able to read No. 20 of Snellen's types, but there was no change in the ophthalmoscopic appearances. There was no increase in the tension of the globes. She complained of neuralgia on the right side of the face. 15th. Bowels confined; ordered podophyllin gr. $\frac{1}{2}$, ext. hyoscyam. gr. v. m.s., which acted well. On the 16th she was able to distinguish the letter of 8 $\frac{1}{2}$, and could read No. 12. The right disc appeared to be becoming better defined, and was less hyperæmic; but the left was in the same state, and a kind of œdematous elevation of the retina was noticed, extending upwards and inwards along the course of one of the large veins. On the 19th, the mercurial treatment being still continued, she was able to read 5 $\frac{1}{2}$ fairly, and 4 $\frac{1}{2}$ with difficulty. She had headache, but it was a "common" headache, and quite different from the pain over the brow she experienced on admission and for some time after. On the 20th she could read 3 $\frac{1}{2}$. The medicine was exchanged for iodide of potassium and syrup of the iodide of iron; but the physical appearances of the fundus were unchanged, which, considering the great improvement that had taken place in the visual powers, was not a little remarkable. On the 31st Oct. she was able to decipher at six inches distance 2 $\frac{1}{2}$ of Snellen: and in this state, with dilated immovable pupils, œdematous retina around the disc, and large and congested retinal vessels, she still remains.

After the above history went to press, this patient died suddenly on the night of the 21st of November. On the 6th of November the note taken was, "Vision improving. Complains of pain coming on occasionally in the head and eyes, as well as in the limbs. Can make out No. 2

of Snellen. Under the ophthalmoscope the appearance of the eyes is unchanged." Under the impression that the patient had caught cold, she was ordered some alkaline mixture, and to remain in bed. On the 17th she stated that the pain in the head was more severe, sometimes commencing at the back of the neck, sometimes in the ear. Pulse 100, weak. To have mist. quinae acid. and five grains of ext. hyoseyani twice a day. The optic discs on this day were scarcely discernible, the part at which the vessels emerged being alone differentiated from the surrounding choroid by its slightly whiter colour. No retinal hæmorrhage anywhere visible. Tongue furred. No appetite. Bowels open. 21st. Pain in the eyes, shoulders, and neck still severe. On the evening of this day she was seen by the day-nurse at 10 P.M., when she was still complaining of pain. At 12 the attention of the night-nurse was attracted to her by hearing a rattling in her throat, and on going to her found her insensible. She died a few minutes afterwards. On the 23d a careful post-mortem examination was made by Mr. Pick and myself, but nothing was found to which the fatal result could be satisfactorily referred. The appearances were, slight flattening of the convolutions of the vertex, the lateral ventricles distended with a rather unusual quantity of clear serum. The fornix and corpus callosum softened, but not broken down. Optic tracts broad and flatter than usual; whole substance of the brain softer than usual, and this was especially remarked in reference to the corpora quadrigemina. There was some slight thickening of the edge of the mitral valve, the remaining cardiac valves normal. Lungs were slightly cedematous. Liver and kidneys congested, the latter to a very marked degree. Microscopical examination of the corpora quadrigemina of the optic nerves and eye failed to discover any distinct morbid lesion. The parts in the orbit were quite healthy.

The nature of this case is extremely obscure, but a general review of the symptoms seems to indicate that it was subacute meningitis.

The case represented in Plate I. fig. 2, had the following history :

The patient was a domestic servant, æt. 26, who came to the Hospital on the 17th March 1868, stating that she had first noticed dimness of vision in the right eye eight years previously, which was accompanied by a divergent squint. When questioned minutely as to her having received any injury, she at first denied having had any; but subsequently remembered that she had, when ten years of age, had a violent blow with the handle of a windlass on the back of the head. Soon after she observed the squint she was operated on by Mr. Rouse, and the eye nearly but not quite restored to parallelism with the other; and for a time she thought she saw better. Gradually, however, the vision of the right eye failed, and now she can scarcely see more than to spell out 6½ of Snellen at eight inches, whilst the divergent strabismus has returned. With the left she can read easily the smallest type. She is free from headache now, but suffered severely from it all through last winter.

There was no increase in the tension of the globe. On examination of the right fundus a remarkable band of separated retina, or of deposit, came into view in the right eye, extending from the optic disc, into which it insensibly merged outwards as far as, with the greatest dilatation of the pupil, the fundus could be explored, becoming, however, gradually more attenuated. The retinal veins were manifestly less and less defined as they neared their point of exit, becoming obscured as it were by semitransparent, hazy, retinal tissue or deposit. The band of greyish-blue colour presented a well-marked fold a little distance from the disc; and at this point a vessel or two emerged as it were from underneath the band, and diverged from it nearly at right angles. The ascending vessel had distinct white lines at its borders; a few white spots were visible on the retina or choroid, above the band, and one well-marked one below. The impression conveyed to my mind was that there was here limited linear separation of the retina from serous exudation, or perhaps with deposit of lymph. The urine of the patient was perfectly healthy. No change has occurred in the configuration or colour of the band since her first appearance, now nearly nine months ago.

The following case, though I have only had the opportunity of watching it through part of its course, is interesting, and in some particulars resembles the previous one.

Plate I. fig. 3.—S. S., æt. 31, a dark-complexioned woman, came to the Hospital on the 19th Nov. 1867, stating that she had always been myopic and experienced indistinctness of vision. About one year previously she received a sharp blow on the forehead from a piece of wood, but thought nothing more about it. Six months ago, after having suffered for some time from languor, an attack of giddiness and headache came on, accompanied with the most intense intolerance of light. The headache was chiefly seated in the occiput. There was extraordinarily increased sensitiveness of the skin of the head, so that the weight of her own hair was intolerable. Hysterical symptoms seem also to have existed, but the catamenial functions were regularly performed. There was no history of syphilis; but five years previously she had suffered much from sore-throat. She was for some time under the care of a homœopath, but finding no improvement, she placed herself under the care of Mr. Rouse, at the Westminster Ophthalmic Hospital. At this time, though the right eye looked healthy outside, there was only quantitative perception of light. Mr. Rouse informed me that he remembered the case very well, and that there was a deposit of lymph which covered a very considerable portion of the fundus. She was ordered decoction of cinchona (1 ounce) and iodide of potassium (5 grains) three times a day, with great advantage to her general health. The myopia in the left eye was found to be $\frac{1}{36}$ th. With the right she could see best with + 40, being then able to make out single letters of No. 8 of Snellen's test-types. On examination with the ophthalmoscope the right eye presented the appearance represented in the drawing. The optic disc was hyperæmic, with a

central white spot. It was surrounded on the apparent outer side by a whitish rim of sclerotic, external to which was the pigmented border of the choroid. On the apparent inner side was a remarkable grayish-blue elevation, presenting some resemblance to the head of an hydatid. The base or neck abutted on the disc, and partially embraced it. The central portion was attenuated and softly shaded below. Its limits were very well defined, and the head terminated at the situation of the fovea centralis. The retinal vessels were of moderate size, and presented nothing remarkable about their course or distribution. The tension of the globe was natural. On examination of the left fundus the optic disc was also found to be hyperæmic, and to have a well-marked posterior staphyloma on its apparent inner side.

In the course of the past year this patient has frequently been in attendance; but though a great variety of medicines has been ordered for her, no change has occurred in the physical appearances, or in the visual power. She still complains much of pain in the eye and temple, and of much lachrymation when looking at anything closely.

Plate I. fig. 4, represents a case, atrophy of the chorio-capillaris, with pigmentary deposit, probably originally either in fibrinous deposit consequent on choroiditis, or on a hæmorrhage.

The patient was a large stout woman, æt. 43, and stated that about four years previously she could see well both to thread her needle and to read the finest print. About that time, without any apparent cause, the vision became dull, black spots floating before the eyes. Eighteen months ago the spots disappeared, and were replaced by a black ring the size of a sixpenny-piece, which followed the movements of the eye everywhere, and was extremely annoying. She never had any injury to the eye, and there had been no pain. She had had six children, and had worked a great deal. Her pulse was extremely small, catamenia irregular. She could read 4 of Snellen at 9 feet; with + 6 she could read No. 12 at 8 inches easily. On examination, both eyes were found to be similarly affected. The optic discs were pearly-pink, with a slight white crescent; the apparent upper portion of the retina was marked by a patch of atrophy of the capillary layer of large size, with very irregular margins, here and there dotted with pigment, and elsewhere delicately shading-off into the normal choroid. The retinal vessels came out in strong relief when they crossed this patch. The media were clear. Such markings as these are not uncommon after choroiditis; and I append the several cases that have occurred at St. George's during the past year, in which it will be seen that the general character of the disease is the sudden or more gradual supervention of dimness of vision in debilitated subjects without pain or very prominent subjective symptoms, but with turbidity of the vitreous, which subsequently clears away and leaves the retina and choroid more or less permanently deteriorated.

Cases of Choroiditis.

CASE I.—E. F., æt. 40 (January 13), a woman of spare build, came complaining of muscæ volitantes. Had been previously in attendance at the Hospital under the care of Mr. Pollock, who had made the following marginal note on her paper: "Fibrin floating in the vitreous humour," and had treated her with cinchona. On examination the right eye was found to respond well to atropine, but the pupil did not dilate quite equally in all directions; yet there were no adhesions to the capsule. The colour of the optic disc was natural; retinal vessels large and tortuous; chorio-capillaris atrophied. Retina itself visible as a hazy or semi-opaque membrane, especially near the disc; fovea centralis visible, natural. Left eye, no muscæ visible; media quite clear; fovea centralis presenting a shrivelled appearance. Acuteness of vision reduced to $\frac{8}{30}$ in left, and to $\frac{8}{20}$ in right. Treatment with tonics and alteratives, pursued through some months, effected no change or improvement.

CASE II.—A. L., æt. 15, a delicate-looking girl, but with fresh colour, presented herself, complaining of loss of sight of left eye on the 11th of May. Three weeks previously she could see perfectly. The failure of sight came on rather suddenly. States that she has recently had a severe attack of rheumatism, resulting from the necessity of being frequently called out of her bed at night to attend on a sick brother. She has been well about a month. The catamenia are regular. She has suffered much, and still continues to suffer, from headache; but there has been neither pain nor flashes in the eye. On examination, large masses of fibrin and pigment were observed floating in the fluid vitreous, the general mass of which was so opaque, that no reflection was perceptible from the fundus. She was ordered tinct. ferri sesquichl. \mathfrak{m} xv. ter die; but as this produced headache and disorder of the bowels, it was exchanged for decoct. cinchona \mathfrak{z} j. with hydrarg. bichlorid. gr. $\frac{1}{16}$ ter die. On the 29th of May the vitreous had cleared considerably; the fundus could now be seen indistinctly, and it was thought that the optic disc appeared dimly as through a fog, with hazy margins; and the vessels seemed to be large. She was ordered to continue the medicine. On the 21st of June the media had become quite clear; and it was now found that an extensive white deposit had formed, chiefly occupying the retina on the apparent inner side of the optic disc, but also surrounding this, almost entirely obscuring the vessels, and rendering it difficult to distinguish the position or limits of the disc. The margins of this deposit were white, and sharply defined against the red choroid; and the surface appeared corrugated, and variously contorted. Only quantitative perception of light was present. This patient still continues to attend at intervals; but no change has occurred during the past five months.

CASE III.—J. B. (July 6) applied for relief on account of dimness of vision in the left eye, which had come on suddenly a fortnight previously. She had always been myopic. She could on trial read any type at three inches with the right eye; but with the left she could

scarcely make out the letters of No. 12 Snellen at the same distance. On ophthalmoscopic examination, the vitreous appeared very cloudy, with numerous large particles of pigment floating through it. She was ordered mist. quinae. On the 17th the media had become much clearer; but she still complained of muscae dazzling her vision. After taking the quina for a month, the tinct. ferri co. was ordered; and it was noted (Aug. 3) that the media were much clearer, and the fundus was red and uniform. There was a large posterior staphyloma. Glasses were recommended; but she ceased to attend.

CASE IV.—H. N., undertaker, æt. 52 (Aug. 21, 1868), complains of dimness of the left eye, which came on suddenly when at Brighton one week previously. With the right eye he could see any type at six inches, but was and had always been myopic (one-sixth). With the left he could only see No. 30 at two inches. The eye looked healthy externally, and there was no increase of tension. He had had no injury. On ophthalmoscopic examination the media in the left eye were found to be very turbid, the vitreous fluid with large patches of lymph or pigment floating through it. The position of the optic disc could only be distinguished with difficulty. The pupil dilated well with atropine. The right optic disc was hyperæmic, with a slight white crescent above, and the retinal vessels large and tortuous. August 17. In the course of the previous two days he had been attacked with sharp rheumatic ophthalmia in the right eye. He was ordered to apply half-a-dozen leeches, and to take a mixture containing tincture of aconite and of colchicum. On the 25th the iris was highly inflamed. By a continuation of the same treatment, by local depletion, and the employment of atropine through the month of September, the attack of iritis on the right side was subdued, the only remains being a slight tag of adhesion on the inner margin. On the 1st of October the media of the left eye were found to have almost completely cleared. The fundus generally was pale, the surface of the choroid presenting numerous white patches of small size and rounded form scattered over it, which were mingled with spots of pigment. On November 6 the media were almost completely clear, the optic disc was very ill-defined, and here and there were patches of considerable size of shrivelled choroid and retina. The vision was reduced to the perception of the hands or large moving objects. No improvement has since taken place (Dec. 14).

CASE V.—T. W., æt. 38, a plumber, came to the Hospital on May 11, complaining of impairment of sight in right eye. He stated that he had a venereal sore nine years ago, gonorrhoea one year ago. The failure of sight was first perceived four years ago, coincidentally with an attack of paralysis from lead, and it had been increasing since that time. On trial he could make out L of Snellen's types with the right eye with difficulty. The acuteness of vision of the left was natural. On examination with the ophthalmoscope the left eye was found to be healthy: the vitreous of the right was found to be turbid, with one or two large floating particles; the choroid mottled and shrivelled behind the disc and fovea centralis (remains of an old blood-clot), with small scattered

spots of pigment. Elsewhere, distributed irregularly, were small whitish swellings in the choroid, probably syphilitic deposits. Under treatment of decoct. cinchon. and the bichloride, and subsequently of iodide of potassium, the vitreous cleared, but no improvement of vision resulted.

CASE VI.—F. C., æt. 48 (September 11), complained that the sight of the right eye has been getting dim for the previous six months without known cause, and that now he has barely perception of light. The beginning of the attack occurred at night somewhat suddenly. During the last month the vision of the left eye has become impaired: occasionally, but rarely, he has seen sparks; but they have been in no way troublesome to him. There was no increase of tension in either eye. The media of the right were so turbid that no examination of the fundus could be made. The lens was clear. In the left eye the media were clear; the choroid round the inner side of the optic disc presented an irregular border; the vessels were of moderate size: the surface too pink in tint. He was ordered cinchona and the bichloride; but after two months' use no change whatever has taken place in it, and the fundus is still perfectly invisible.

Plate I. fig. 5, I have inserted as an example of the appearances presented in a case of progressive myopia, which I spent much time in copying on a large scale, though the details do not come out so clearly as I could wish when reduced. The patient was a French fishmonger, who lived in St. Giles's, spent much of the night in frying fish over a charcoal fire, and in whom the vision had been gradually but slowly deteriorating, according to his own account, for ten years. He could now only read No. 20 of Jäger. The optic disc was oval, surrounded by an irregular circle of posterior staphyloma. The choroid to a considerable distance around the disk was atrophied, in some parts more, in others less; whilst the surface was almost everywhere dotted with pigment. Near the border the dots were very regularly arranged, and gave the impression of individual cells having broken down, allowing their contents to escape.

Plate I. fig. 6, I have figured as a somewhat unusual instance of posterior staphyloma, unconnected with the entrance of the optic nerve. The patient was a girl of 19, who was brought by her parents for marked convergent strabismus affecting both eyes. The account given was, that she was a very healthy child, and that her eyes were perfectly natural up to the age of two years, when she had a succession of fits. The squint then appeared; the left eye being the

worst. She was able to work in the house, but could do no sewing or reading, though her mind was fully developed, and she was most anxious to learn. On trial she was found to be able to read No. 16 of Jäger at six inches, and No. 12 at four, the right being the best. No. 20 concave suited her best; and no operation was recommended. On examination, the fundus of the left eye presented a vertically-elongated disc, on the apparent outer side of which was a nearly-circular yellowish-white patch. On the surface of this several retinal vessels ramified, their position being very distinctly marked; and at the upper part were a few dots of pigment. The borders of the patch were sharply defined, and the choroid was here, no doubt, deficient, permitting the light to be reflected from the sclerotic. On the apparent inner side of the disc was a patch of nearly equal size, but of much whiter colour, with less even and sharply-defined margins, and with much more pigment scattered on its surface. It gave the impression of being a mass of fibrin, the residue of some old hæmorrhage.

Case of nævus in lower lid of left eye; figure-of-8 ligature applied from within; suppuration; good result.

The drawing, Plate II. fig. 7, represents a nævus of the lower lid in a little child only four months old, which however was growing very rapidly, and evidently extending in depth as well as in surface. The child was placed under chloroform, and a figure-of-8 ligature passed from the inner surface of the lid; an operation that required considerable care, and was only accomplished with some difficulty. Two days afterwards suppuration occurred, accompanied by swelling of the lid, and the external signs of an abscess. A slight purge was administered, and warm poultices applied. The result was extremely satisfactory, for with the subsidence of the inflammation, the vessels of the nævus were found to have become obliterated; and when the child was brought some months afterwards no trace of the defect remained.

Case of supposed tuberculous tumour in the globe; extirpation of the eye; development of cancer in the orbit; death.

Plate II. fig. 8.—E. P., æt. $3\frac{1}{2}$, a fine healthy-looking boy, was brought to the Hospital in the early part of February; the mother

PLATE II.

FIG. VII.

Sub-conjunctival nævus.

FIG. VIII.

Intra-ocular cancer.

FIGS. IX. AND X.

Inflammation of the eye, consequent on abscess in pons implicating
the origin of the fifth pair of nerves.

FIG. XI.

Episcleritis.

FIG. XII.

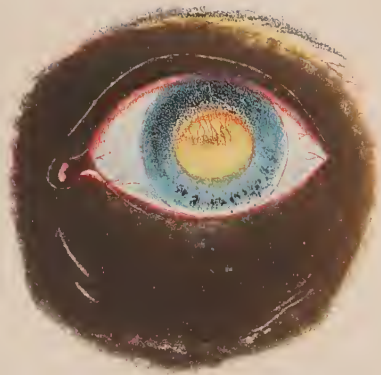
Abscess in the orbit.

PLATE II.

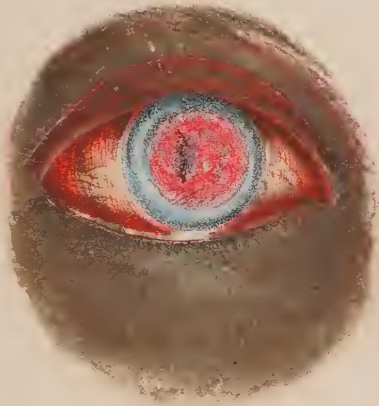
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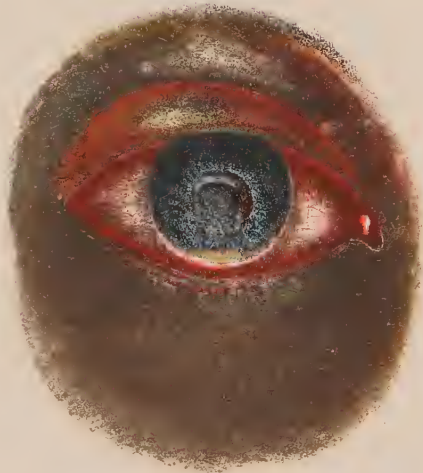
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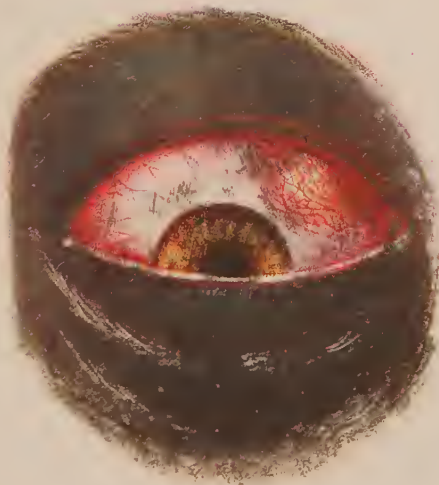
9.



10.



11.



12.



stating that for the previous six months she had noticed a glittering appearance in the left eye in certain lights, and had lately ascertained he was unable to see with it. The only ailment the child had ever suffered from were several slight fits when teething. Five brothers and sisters had died when very young from various causes, but none from cancer; nor was there any history of cancer in the family. On examination the globe presented the appearance seen in the fig. The sclerotic and cornea were healthy, the anterior chamber of moderate depth, the iris natural in position and colour; the media very clear. The fundus appeared of a brilliant yellow colour, obviously from the projection of a lobulated mass into the vitreous, on the surface of which a few vessels ramified, whilst here and there were a few blood-red points. The brilliancy of the colour was so great, and so different from other cases of cancer of the globe I had seen, that I believed it to be a tuberculous mass. However, as this was doubtful, and the disease was certainly advancing, I recommended extirpation of the globe, to which the mother, after some hesitation, assented. The operation was performed on the 27th of February, without notable occurrence, beyond that the bleeding from the divided vessels was free. On the 3d of March, five days after the operation, he was well. The eye was placed in chromic acid to harden, and in the course of three weeks was examined. On dividing the tunics I was surprised to find the tumour had become perfectly diffuent, the fluid resembling creamy pus. On examination the whole appeared to consist of small, rounded, finely-granular cells, which cleared with acetic acid, and presented one, two, or three small nuclei; mingled with these were a few capillary vessels. The optic nerve was healthy. On the strength of these appearances I ventured to encourage the mother, and to tell her it was probable the disease would not return. The event, however, belied my forecast. On the 10th June, just three months from the date of his discharge from the Hospital, the boy was brought to me again; the mother stating that the disease had reappeared. On examination the orbit was found to be filled with the new growth, which had attained the size of a fowl's egg, and was 6 inches in circumference, and $3\frac{3}{4}$ in. across; the surface was broken and slightly bleeding. A consultation was held upon him in conjunction with Mr. Hewett, Mr. Lee, Mr. Holmes, and Mr. Rouse; and it was decided that the disease was too far advanced to afford any prospect of cure by scooping out the contents of the orbit and applying chloride of zinc or the actual cautery. On the following day I injected the tumour in six or seven different places with acetic acid, and directed ice to be constantly applied to it. The following day it had increased 1 inch in circumference. He was ordered to take tinct. ferri mur. $\mathfrak{m}\mathfrak{v}$.; tinct. opii $\mathfrak{m}\mathfrak{ij}$. ex aq. ter die; and Condyl's liquid to be applied to the tumour, as the little fellow complained of the smell preventing him from eating. On the 19th June the circumference was $7\frac{1}{4}$ inches, and the vertical measurement 4 inches. There was no pain, nor any constitutional disturbance; he slept well. The tongue was clean, the bowels open, the appetite good, and he was in good spirits, and played about the ward. The injection of acetic acid (1 to 4) produced little or no effect.

On the 26th June the circumference of the tumour was $8\frac{1}{4}$ inches, and its vertical diameter $4\frac{1}{4}$ inches. A few grains of a powder composed of pulv. opii gr. ij., magnes. carb. gr. xv. were applied. On the 29th the growth of the tumour was checked; a large slough had formed on the surface. On the 3d July its girth was $7\frac{3}{4}$ inches, its diameter 4 in. The opium was again applied, but without any effect; and a few days later it was again injected with acetic acid; but beyond rendering the parts where it was introduced soft and oedematous, no change was noticed. On the 31st July it had increased to $9\frac{3}{4}$ inches in circumference, and $5\frac{1}{2}$ inches transverse diameter, which was rather larger than the vertical. It concealed all but the tip of the nose, and descended to very near the mouth; the surface was dry, and notwithstanding the free use of Condyl's fluid, ill-smelling. The tumour was mushroom-shaped, and so movable that to free the child from the inconvenience of so large a mass, I applied a ligature; on the following day there was some pain and feverishness; and the tumour, which had assumed a black colour, was $12\frac{3}{4}$ inches round and $6\frac{1}{2}$ inches vertical diameter, was quite movable; the mass separated on the 8th September. The retraction of the pedicle was very remarkable. The eyelids had both disappeared, and the orbit appeared almost completely empty, the parietes being coated with a thick white pseudo-membrane. He expressed his sense of relief at the removal of the tumour. A considerable portion of the cheek, temple, and brow were red and erythematous from constant contact with the overhanging tumour. The child still ate, drank, and slept well; the orbit was well washed out with Condyl's liquid two or three times a day. On the 15th September a smooth rounded swelling was observed above the posterior part of the zygoma; elastic to the touch, but not painful. It was obviously a secondary deposit of cancer. On the 23d the growth of the tumour in the orbit, rapidly advancing, had gained the level of the orbital rim. The swelling over the zygoma had increased in size to that of half a walnut. He complained of headache, and had been sick. Pulse 120. Various medicines were ordered with a view to alleviate the sickness, as effervescent mixtures, &c., but without effect; and on the 3d October he had two or three convulsive fits, affecting the arms and legs chiefly, and accompanied by loud shrieks, lasting twenty minutes. He died on the evening of October 4th.

On post-mortem examination one or two small masses of cancer were found in the liver on its superior surface, and one small spot of tuberculous matter in the lung. The mass of medullary cancer on the temple was subjacent to the temporal muscle, and was eroding the bone, spiculae of which projected into it. On removing the brain, a large mass was found occupying the middle line just over the pituitary fossa, of the size of a walnut, and continuous with the mass in the orbit through the optic foramen. There was another mass on the inner side of the temporal, which apparently was a continuation of the intra-orbital mass through the sphenoidal fissure, and just opposite to that on the temporal surface. The brain-substance was unaffected. On microscopical examination of the tumour, it appeared to be exclusively composed of

minute oval-rounded and polygonal cells; none were tailed or compound. The sheath of the optic nerve was thoroughly infiltrated with similar cells, and the nerve-tubules everywhere undergoing fatty degeneration.

In February a second case of cancer occurred, in which the disease was present in both eyes.

E. M., æt. 10 months. A healthy-looking child. The mother first noticed, about a month previous to her appearance at the Hospital in February, that the child never fixed the eyes on any object. On examination the left eye presented a dun-coloured mass projecting from the fundus, over which numerous large retinal vessels ramified. The right eye was in an earlier stage of the same disease, no tumour being apparent, but a brilliant reflection of light occurring when the child was placed opposite the window. A consultation was held respecting the propriety of removing both globes; but the majority of the surgeons were opposed to the proceeding, on the ground of the great probability of the return of the disease, and no operation was performed. The mother was directed to feed the child on milk and cream. The child was brought again in December, but the disease had made very little progress.

The following case of disease of the anterior portion of the pons Varolii, implicating the origin of the fifth nerve of the right side, and occasioning defective nutrition of the right eye, and death, is very interesting.

Plate II. figs. 9 and 10.—Fred. J. H. was sent to me by Mr. O. E. P. Chard, of Ecclestone-street South, on the 21st April 1868. The patient was a moderately robust and very intelligent labourer. He stated that he had always been a healthy man, had only suffered occasionally and slightly from rheumatism, and that about eight weeks previously he was employed in laying bricks in Battersea-park. For a few days he suffered from headache, affecting the right brow and temple, and impairing his sight so much that he found it difficult to see the line. He at first attributed it to rheumatism; but the pain gradually increased in severity, till one morning on going to work at 6 A.M. he found himself so ill at 8 that he was obliged to go home, and betook himself to his bed, where he remained suffering more or less severely from headache for a fortnight. He then for the first time noticed that the right half of his face was benumbed. The numbness lasted for three weeks before there were any signs of inflammation of the eye, but the vision continually deteriorated.

On examining the eye the following symptoms were noted. The upper lid was slightly swollen and red, and drooped to the extent of about half an inch below the level of the opposite one. The conjunctiva generally was suffused, the redness being produced both by the superficial and by the episcleral vessels, and the colour was therefore rather

dull. It was dry. There was not any defined circumcorneal zone. The surface of the cornea was everywhere dull, as though it had been breathed upon, but the markings of the iris were distinctly visible through it near the margin. The centre of the cornea (fig. 10) was ulcerated. The ulcer was circular in form, equal in size to the pupil; the lower part of whitish colour, the upper very shallow, and appearing as if the epithelium had been abraded. There was a very small quantity of pus at the bottom of the anterior chamber. The pupil was fixed; no motion could be observed either consequent on the direct action of light, or consensually. He could just discern No. 6 of Snellen at 4 inches with the affected eye (all types with the other). The tension was slightly below that of the opposite eye. There was little or no lachrymation. He could turn the eye inwards, but the external rectus was paralysed, except in so far that the eye, after being turned inwards, could be brought to the middle line. The superior rectus and two obliques acted very feebly but perceptibly; the inferior rectus acted well. I was unable to perceive, and he himself did not notice, any difference in the temperature of the skin of the two sides; he said the eye felt warmer than the other, but there was no pain in it. The right lateral half of the tip of the nose was redder than natural. The right nostril was dry, and he had for some time had a small fissure at the angle. The tongue was protruded straight. Pulse very feeble. The malar bone was more prominent on the right side than on the left. He complained of a feeling of stiffness in moving the jaws, though he could move them from side to side and bite hard. He was unable to feel the morsels of food on the right side; they lodged between the teeth and the cheek, and in eating he had to remove them from time to time with his finger. The loss of sensibility of the right half of the head and face was very marked; but he could tell whether the sharp or flat end of a pencil was pressed with moderate force on the cheek and temple.

On first examining the case I came to the conclusion that the symptoms were produced by the growth of a tumour within the cranium, or quite at the back of the orbit, producing pressure on the fifth and sixth and part of the third nerves. In this I thought I was supported by the general interference with nutrition, apparently arising from pressure on the fifth, and by the projection of the malar eminence. I ordered him to keep the eye closed with a pad of cotton-wool, and to take some quinine mixture; and I wrote to Mr. Chard, asking for any previous information he might have of the case. In reply, I received the following communication:

“Eccleston-street South.

“DEAR Sir,—I am sorry I did not send my patient to you sooner. I saw him first on February 10th, and for two days considered that he was suffering from brow-ague, as the temple and forehead were much

swollen and inflamed, and subject to severe paroxysms of pain. There was little headache (the dropping of the lid, I thought, was due to sympathy). The quinine given, however, produced intolerable headache and fever; and the pain and pricking sensation having extended to the jaw, I was induced to think there was some cerebral congestion; I then found the ptosis had become nearly complete, and the external rectus did not act; the right angle of the mouth (when the mouth was opened) was drawn considerably to the right side, as well as the tip of the tongue when protruded. There was absence of sensation from the vertex to the lower part of the jaw on the right side, but I did not notice any particular difference in the movements of the muscles of the two sides. There was no intolerance of light, or delirium, indicating inflammation of the brain. I was in doubt about the cause, whether it was owing to exposure to cold, or to rupture of some vessel in or about the root of the fifth nerve. I changed the treatment to leeches and purgatives, followed by tonics and iodide of potassium, with blisters, and he has lately improved in health, as well as in the sensation of the face; and more especially in the eye. Just before resuming work the eye became inflamed, but there was no ulceration until I saw him the day before he called on you. Any further information that I can give you will be a pleasure, if you will write again. Yours truly,

“O. E. P. CHARD.

“P.S. He was ill one week before I saw him, and was under the care of Mr. Oakman. I have given him the steel as wished. He is one of my club-patients. The swelling over the malar bone was not apparent at first. It came on as that of the temple and forehead gradually subsided.”

On the 24th of April I saw him again. The sensibility of the head, face, and eye on that side had greatly diminished. The surface of the eye and even of the ulcer could be touched with the finger or the smooth end of a pencil-case without the least wincing. The ptosis was more complete. The hypopyon had increased to double the amount. The cornea was duller and dry, and he could only just count his fingers. He stated he had no taste on that side of the mouth, which felt as though it had been scalded. Smell not very acute, but no difference between the two sides could be detected.

On the 28th of April the whole substance of the cornea had become hazy; the hypopyon had reached to midway between the corneal border and the inner margin of the iris, the pupil being of moderate size. Pupil was quite fixed. Iris of a dark muddy indigo colour, contrasting strongly with the bright blue of the opposite one, and with a little deposit round the pupillary margin. The tension of the globe certainly increased. There was no pain or throbbing, but the eye watered slightly on exposure to light. He could just make out L of Snellen at four inches. Could see the cross-bars of the windows of the room he was sitting in, and the brightly-illuminated windows of the opposite side of the street. The points of a pair of compasses were felt on the sound side as separate when about one-sixth of an inch apart; whilst on the affected side they

were not distinguished as separate till they were about $1\frac{1}{4}$ inches apart. When the head was well supported on the back of an arm-chair, successive weights of 1, 2, 3, and 4 oz. were placed on the temple and cheek, He was unable to distinguish the presence of the three first, but the last, he said, struck cold. When warmed, he was unable to perceive it. It was only when the weight amounted to 6 oz. that he could feel its pressure. He was unable to distinguish vinegar when brushed over the tongue of this side until he had withdrawn it into the mouth. His pulse was 74; bowels regular, and tongue quite clean.

May 8th. The hypopyon had reached the pupillary margin; the upper border of the fluid was strongly convex. I tapped the cornea with a broad needle, and a little pus escaped; but a tough plug of puriform lymph remained behind. The operation was painless.

May 11th. General symptoms the same. Opacity of cornea increasing; can only just see his hand waving. Sensibility of cheek rather more acute, two points being felt at the distance of an inch. Slight herpes on lower lip. Tongue on both sides alike in colour, cleanness, and moisture; but it felt "sleepy-like" on the right side.

May 25th. During the last few days the eye has been discharging considerably. The conjunctiva is of a more brilliant red, but not at all chemosed: it is more sensitive. The old ulcer, after gradually penetrating deeper, has perforated; and coincidently with this the cornea has sloughed. The eye presents the appearance shown in fig. 9, the surface being marbled with purplish red, whilst near the centre is a dark spot. The vessels seem to come from the iris, which probably formed an anterior synechia after the perforation of the ulcer. The margin of the cornea is of a dull-gray colour. He can still see his hand wave.

Finding that no improvement occurred, H. now ceased to attend; and when I next heard of him, on the 16th of July, he was dead. To keep up the history of the case, however, I append the following notes, which have been kindly communicated by Mr. Oakman, under whose care he then placed himself.

June 26, 1868, was the first occasion on which I visited him. Found him as follows: Completely prostrated. Had had constant vomiting for the last five weeks; not the smallest quantity of the lightest kind of food could be kept on the stomach. Vomit consisted of a greenish-yellow matter. Complained of pain in stomach, and constant heavy pain across the brow, more particularly of the right side. Bowels moved once during the day. Tongue brown, and covered with a thick dry fur. But little urine passed, and that thick, and with a strong disagreeable odour. So bad was his condition, that I expected his death hourly. Ordered him bismuth, trisnit. grs. x., with ammonia and a mild tonic every four hours.

27th. Had brought up first dose of mixture; but the second had been retained. Had taken a cup of Ridges' food, and some champagne, neither of which had been returned. His general condition a little improved.

28th. Had vomited only once during the previous day; the effort not nearly so distressing as on previous occasions; and had taken three cups of food and some wine. Pulse was stronger; pain in stomach relieved; tongue beginning to clean at edges. Had some sleep during night. Pain over brow not so violent. Rep. mist.

29th. No vomiting, and improved in every way. Had taken beef-tea.

30th. Still improved; intended getting up. No vomiting. Ordered mist. ferri amm. cit.

July 1st. Not quite so well; felt the effects of being up the previous day. Bowels had not acted since June 26. Gave a mild purge. No vomiting.

3d. Bowels had moved once. From this time he began to get gradually worse, refused food, and died quite exhausted on July 15th.

The post-mortem was made on the 17th July, about forty hours after death. Permission was only obtained after much entreaty and persuasion, and then limited to an examination of the head.

The weather was extremely hot. The body was in an advanced stage of decomposition, and greatly swollen. Rigor mortis not quite passed off. The brain was very soft. The sinuses were filled with air and blood. The arachnoid stripped off easily. The fifth nerves broke down on attempting to remove the brain. The crura of the cerebellum were also so soft that the latter was left behind, and when subsequently taken out, was found to be almost diffuent. On placing the brain on a plate, with its lower surface uppermost, it was immediately noticed that the anterior part of the pons varolii, just behind the posterior perforated space, was the seat of an abscess, the size of which was about half that of a small walnut. The edges of this cavity were very irregular, flocculent, and of a deep slate-gray colour; the cavity extended a little way into both crura, but farther into the right than into the left. The crura, for more than an inch onward, were of a deep slate-gray colour, which terminated by a tolerably well-defined line (? indicating extent of purulent infiltration). The same discoloration was also observed to extend through a considerable portion of the pons, and at least beyond the point of apparent origin of the fifth nerves. But in consequence of the fifth having broken down in removing the brain, and the exceedingly soft condition of all the parts, no precise statement could be made in regard to their relations to the abscess. The colour of the corpora striata on both sides was of a similar slate-gray tint, whilst the optic thalami, though very soft, preserved their natural appearance.

The case represented in Plate II. fig. 11, is a form of disease that is not very unfrequent, but which is scarcely noticed in English works on ophthalmic surgery. It consists of a circumscribed swelling of the connective tissue, over some part of the sclerotic, occurring for the most part in adults, and has hence been termed episcleritis. During the early

part of last year I saw four or five cases, all presenting the same general characters, short notes of which I append. Only one occurred in the summer. The affection is characterised by its slow progress, by its being accompanied by comparatively little pain, such pain as there is being of an aching or rheumatic character, and affecting the brow as well as the eye, by its attacking any portion of the exposed surface of the sclerotic, and presenting the appearance of a smooth and tolerably well-defined elevation of rose-red colour, with a yellowish tint, on and in which vessels of considerable size ramify. The conjunctival tissue over the swelling appears chemosed or semitransparent, adding to its size, and rendering the tumour palest at the most prominent part. It has no tendency to ulceration or to suppuration, but after enduring for a very variable length of time slowly disappears under treatment. The episcleral vessels, or those more deeply-seated vessels which run in a straight direction towards the cornea, are congested, and present the usual rose-red colour, thus conferring on the eye generally the aspect of a rheumatic case.

It appears to be caused by cold acting on a debilitated subject; and the treatment I have adopted, and which has been very successful, has been the administration of aconite in three- and colchicum in twenty-minim doses in camphor mixture.

CASE I. (from which the drawing was taken.)—F. D., æt. 28, a pallid-looking man, by occupation a bookbinder, came to the Hospital on the 24th of January, complaining of pain and inflammation in the right eye. The pain was of a dull, heavy, aching character, and was most severe at night; at first sight there was not much inflammation visible. On raising the lid, however, and directing him to look down, a circumscribed swelling of pale-rose colour, and translucent near the centre, came into view. Some vessels of considerable size ramified on the surface, and the episcleral vessels generally were somewhat congested. He believed it had been coming on for three or four days, and attributed it to meeting the wind and exposure to cold during several hours skating on the Serpentine. He was ordered the tinct. aconiti (mij.) c. tinct. colchic. (mxx.) ter die. On the 28th he was decidedly better, the swelling had diminished, and its colour was pale. On the 2d of February this swelling had almost disappeared; and on the 6th, only a trifling redness marked the spot it had formerly occupied.

CASE II.—J. G. O., æt. 27, a musician playing the cornet; a short,

thick-set man, with Bardolphian nose, and evidently indulging freely in alcoholic potations; came to the Hospital on the 5th of February, stating that about a month previously, in consequence of exposure to cold, he had had a severe catarrh, attended with violent spasmodic cough. The eye began to be inflamed soon after. Both eyes are affected, but the right is much the worst. The appearances presented are, that a rose-red swelling of chemosed conjunctiva extends from the outer canthus, where it is most prominent, to the caruncula, where it imperceptibly passes into the natural tissue along the lower part of the eye; it recommences by a gentle swelling above the caruncula, and extends about one-third of the distance to the outer canthus along the upper part of the eye, when it terminates by a well-defined and prominent margin. The outer and upper part of the sclerotic and the circumcorneal portion are quite free from vessels, and of their natural colour. The swollen portion presents a somewhat abrupt border, and is lobulated; large vessels ramify on its surface, but on reaching the border do not pass on to the cornea, but divide and run right and left. Through the semi-transparent and chemosed portion of the conjunctiva the deeper tissue could be distinguished, in which purple vessels were visible. There was some lachrymation and intolerance of light. He was ordered to bathe the eye with alum-lotion, to take the *mist. aconit. cum colchico*, and to wear smoked glasses. A week after, he was better, but the swelling was still very considerable. He could not sleep on account of the pain over the brow, and cough. He was directed to take five grains of Dover's powder at night, and to continue the medicine. On the 23d he was "better." On the 5th March the right eye was materially improved, but the left was still bad. To have *mist. quinae* \mathfrak{zj} . *ter die*. 10th March, left eye improving, the right only affected above. 2d April, nearly all the inflammatory symptoms subsided, except at the upper part, where there is still some swelling. At the end of another fortnight he returned quite well.

CASE III.—Mary T., *æt.* 57, a fresh-looking woman, February 5th. Six weeks previously she had a slight cold in the right eye. Shortly afterwards severe pain came on in the ball of the eye and the orbit, keeping her much awake at night. Has been subject to headache for many years from constipated bowels. Her occupation is that of a toll-gate keeper; and from having to turn out of bed at night, she is much exposed to cold. The swelling in this instance presented almost precisely the same features as those represented in the drawing, except that it occupied the outer and inferior part of the sclerotic, near the outer canthus; and she was treated by the same means. She came up from the country, and I was unable to follow out the case.

CASE IV.—Mar. 9, S. N., *æt.* 68, a pale, delicate-looking woman, presented herself with a single, well-defined, rose-red swelling on the outer and upper part of the sclerotic of the left eye. It had been present for four days. She had been for some weeks previously attending a sick husband, when in the middle of the night, whilst preparing some food for him, she felt the cold strike her eye. The pain continued to affect

the brow and temple, and was very severe the day before she came to the Hospital. To-day it is less. She stated that she was subject to rheumatism, to indigestion, and palpitation of the heart. The tongue was clean. The *mist. aconit. c. colchico* was ordered. In the course of ten days the inflammation and swelling had materially abated, and in fifteen days from the time of her applying at the Hospital for relief there was no trace of the disease remaining.

Two cases of abscess in the orbit.

CASE I. History of a blow, followed after two months by inflammation in the connective tissue of the orbit; great cedema of the lids; chemosis of the conjunctiva; protrusion of globe; temporary loss of vision; treated by deep incisions; gradual but complete recovery.

Plate II. fig. 12.—Thomas P., æt. 30, a groom, admitted November 20, 1867. *History.* About two months ago he received a blow on the left eye, which was followed by some trifling pain and inconvenience, but insufficient to prevent him from following his occupation. On the 13th November, the pain increased considerably, assuming a severe shooting character, and altogether preventing sleep. A day or two subsequently, the eyelids began to swell, and had gradually continued to do so.

Present symptoms. On admission, the lids of the left eye were to the last degree cedematous and of a dark-purple colour, their surface hard, and only pitting on firm pressure. It was almost impossible to separate them in order to examine the globe. The conjunctiva was greatly chemosed, and protruded between the borders of the lids. The lower portion of the cornea was just visible, and appeared to be clear. There was little or no lachrymation. The pain was intense. Vision was reduced to the mere quantitative perception of light. This appeared to be due to the stretching of the optic nerve, as the whole globe was thrust forward to the extent of at least half an inch beyond the plane of the opposite eye, the cornea being nearly on a level with the bridge of the nose. The tongue was coated; the pulse 100, of mod. volume, and the bowels confined for several days. He was ordered a purgative pill and draught; *mist. quiniæ* ℥j. ter die, to be commenced after the purge had operated. On the following day the pain, though still severe, was relieved, and instead of being acute and lancinating was throbbing. A poultice was ordered to be applied throughout the day. On the 23d, the pain and protrusion of the globe continuing, a double-edged Wenzel's knife was thrust into the orbit to the depth of an inch and a half along the side of the globe in three places, above, below, and to the outer side; free bleeding followed, accompanied by the discharge of a very small quantity of pus; the application of the poultice was continued. Immediate relief followed the incisions, and he slept well on that night. On the following morning the tension had diminished, the eyelids were of a paler colour, and could be opened a little by his own efforts, and more freely by manipulation. The cornea was clear, iris of natural colour, pupil of moderate size; vision so far improved that he could see

the hand moving between him and the light. His diet, which had hitherto been broth, was now changed to meat. He continued to improve until the 3d December 1867, when a relapse took place from exposure to a draught of air at the open window of the ward. The chemosis again became considerable, and was accompanied by severe pain. The bowels were again opened freely by a purge, and hot poultices were applied; but it was not thought advisable to repeat the incisions. On the following day he was much easier, and the swelling had subsided, and from this time he continued steadily to improve. The note taken on 19th December (by Mr. Lake) is: At the present time the chemosis has almost entirely disappeared. The cedema of the lids has subsided, but the lower one is still somewhat swollen; the vision is perfect, and there is little or no pain; the eyeball is still rather prominent. On the 6th of January, he was discharged well.

CASE II. History of exposure to cold, followed by rheumatic inflammation of the eye, extending to the intra-orbital structures, with great swelling of the lids. Chemosis and protrusion of the globe; complete loss of vision; infiltration and sloughing of the cornea; deep incisions made into the orbit, effecting relief of pain, but no return of vision; collapse of eye.

August 29th, 1868. J. G., æt. 29, a slater, and an emaciated, pallid man. *History.* Right eye lost by a blow five years previously. A fortnight ago he was doing a job, when he got very wet, but took no notice of it. On rising the following morning, the left eye was considerably inflamed, and there was great intolerance of light; he used some sulphate-of-zinc lotion; but the eye gradually got worse, and the next day the vision began to be impaired; swelling of the lids and conjunctiva commenced four days ago.

On admission, the lids of the left eye were intensely red and swollen, and the conjunctiva, greatly chemosed, protruded between them. The whole globe projected from the orbit to the extent of fully half-an-inch beyond its healthy position. The upper half of the cornea was tolerably clear, the lower opaque from deposit between the lamellæ. The epithelium was abraded from the central portion. The state of the pupil could not be ascertained; pain most severe and continuous, extending over the temple and brow, and accompanied by much lachrymation; vision entirely lost, tongue moist and furred, pulse 76, mod. vol.; no appetite. As soon as he was put to bed, I made three deep incisions—one above, one below, and one to the outer side of the globe, after which a warm poultice was applied; no pus escaped, but free bleeding occurred. He was ordered half a grain of morphia every eight hours. August 30th. Has passed a good night, the first for a fortnight. This morning the pain has recurred, and is now very severe; the incisions have not in any way reduced the swelling of the lids or the chemosis; the lower two-thirds of the cornea are quite sloughy. 31st. The slough of the cornea has separated, and the iris is projecting; the swelling of the

lids and chemosis have slightly diminished; the chemosed portion is quite dry and tender. September 2d. Lid can be raised a little by his own effort; there is now little pain, the swelling diminishes only very slowly; to expedite it, two or three punctures were made with a lancet. To exchange the morphia pills for *mist. quiniæ* and a fuller diet. September 14th. Swelling now reduced considerably; two projections of the conjunctiva, the size of a haricot bean, still present at the outer and inner canthi respectively; the cornea shrunk to the size of a silver penny, deeply imbedded in the fossa formed by the swollen conjunctiva; little pain now. On the 3d of October, swelling almost entirely gone, the globe becoming squared by the action of the muscles; globe quite soft. From this time recovery of the general health, though with total loss of vision, proceeded steadily.

The history of these two cases, which, though differing in their origin, presented several features in common, is of much interest. In both there was great oedema of the lids, chemosis and protrusion of the globe, with intense pain, affording a strong presumption of the presence of a collection of pus behind the globe, which was, however, only present in small quantity in Case I., though very deep exploratory incisions were made. There can be little question, however, that in all such cases the same procedure should be adopted; since even if no abscess be reached, it at least effects free local depletion, and obviates the evil effects of pressure on the globe. The good effects of it were immediately visible in Case No. I., the vision improving at once, though probably, if another day or two had been allowed to elapse, the nutrition of the cornea would have begun to be impaired. The bad result of the second case is to be referred to the circumstance that the inflammation commenced not, as in the former instance, in the cellular tissue of the orbit, but in the eye, from whence it extended to the other textures. Before the incisions were made, the eye was already lost. Had he presented himself at an earlier date, the cornea should have been punctured, or Mr. Hancock's operation of division of the sclerotic in the ciliary region might have been resorted to, with good prospect of success. The case teaches the importance of early, prompt, and decisive treatment.

The following was a well-marked case of exophthalmos:

C. D., æt. 25, was admitted on the 28th January, with the following history. She had enjoyed good health up to about a year and a half previously, when, coincidentally with disturbance of the catamenial function, the discharge being very scanty and irregular in the period of its appearance, she began to notice the projection of her eyeballs. She suffered at this time with much pain over the brow, and from then to the date of admission no recession of the globes had taken place.

On admission both eyes presented an unpleasant stare, the sclerotic showing for about a line both above and below between the margin of the cornea and the point of contact of the lids with the globe. The sclerotic was of a clear blue. She complained of great nervousness and sense of fulness in the eyes, but there was no marked impairment of

vision, nor any increase of tension in them. The thyroid gland was manifestly enlarged, with considerable pulsation. On rotating the eyes strongly inwards, a plexus of large veins came into view at the outer canthus. She was obviously of a very nervous temperament, starting at any sudden sound, and flushing deeply when addressed. She stated that she had almost daily attacks of epistaxis. She was ordered fifteen minims of the perchloride of iron three times a day; a shower-bath at 65° Fahr. every morning; good diet, and a pint of porter. On the 6th February she was manifestly improved in all respects, and for the first time for a considerable period the catamenia had been freely discharged. On the 18th, finding the confinement in the Hospital wearisome, she left, her medicine being exchanged for decoct. cinchon. ℥j. and liq. strychniæ ℥iv. t. d. This she continued to take as an out-patient for a considerable period, and at length ceased to attend. She returned in the middle of October to show herself, and was in all respects better, the protrusion of the globe being so slight as scarcely to attract attention.

I may be allowed briefly to allude to a case of a comparatively rare disease termed "synchysis scintillans," in which the vitreous contains numerous crystalline particles of cholesteroline.

J. O., æt. 57, admitted 19th February, states he could see well with the left eye up to the end of the year 1863. About that time he was carting lime late in the evening, when the wind blew a quantity of it into his eye; severe inflammation followed; but he had no medical advice. Since that time the vision of the eye gradually failed, until, in the summer of 1867, he was obliged to give up work. He was married, and had had to work hard for a large family. He had never suffered from syphilis, but with the exception of the last year or two had had much rheumatism. The eyes appeared outwardly healthy; but on ophthalmoscopic examination of the left eye the vitreous was seen to be full of bright shining particles. The fundus could be clearly discerned, the optic disc being pearly white, but not absolutely dead-white as in atrophy; vessels of moderate size, choroid of natural colour; no apparent lesion of retina. The globe was natural as regards its tension. With the right eye the acuteness of vision was one-quarter; with the left or affected eye he had only quantitative perception of light.

HENRY POWER.

Nature of disease.	Dec.		Jan.		Feb.		March.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Total out-patients.		Total in-patients.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the Conjunctiva:																												
Conjunctivitis simplex	1	4	1	6	3	5	1	3	3	5	3	4	2	7	3	3	3	4	1	5	.	6	2	4	20	56	.	2
" chronica	.	.	.	2	.	.	.	1	.	1	.	.	1	1	.	3	.	.	.	.	.	.	.	.	1	8	.	.
" catarrhalis	.	.	.	2	1	.	1	1	.	.	.	.	1	1	2	1	.	.	1	1	.	.	.	.	6	7	1	1
" muco-purulenta	.	.	1	1	.	.	1	1	3	1	1	6	2	4	2	1	2	2	.	1	.	2	2	.	16	32	2	2
" phlyctenular	.	4	.	3	1	2	3	4	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
" erysipelatosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
" purulenta neonatorum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
" gonorrhoeica	1	.	1	.	.	.	.	.	1	1	2	1	.	.	2	.	2	.	.	.	.	.	1	.	7	4	.	.
" catarrho-rheumatica	1	.	.	.	.	.	1	.	.	.	2	2	.	.	2	3	.	1	.	2	.	.	1	.	6	7	1	.
" verruca	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	1	.	.	.	.	1	2	.	.
Echymosis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pinguecula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diseases of the Lids:	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Blepharitis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hordeolum	1	2	.	.	.	.	.	2	.	1	1	1	2	.	.	.	.	.	.	.	.	.	.	.	1	2	5	.
Ophthalmia tarsi	4	10	2	1	3	1	5	2	2	1	4	5	1	2	3	3	3	3	5	8	3	4	1	1	35	43	.	1
Tylosis	.	1	1	1	.	.	.	.	1	.	.	.	1	.	1	2	.	1	1	2	.	1	.	.	3	4	.	.
Tarsal tumour	.	3	1	2	.	2	.	.	.	.	.	.	1	.	.	.	.	.	1	1	.	.	1	.	3	12	.	.
Erysipelas	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.
Abscess of lid	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	.	.
Herpes of lid	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.
Impetigo of lid	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.
Ulcer of lid	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	11
Granular lids	1	.	1	.	.	.	1	1	2	.	.	.	.	1	.	2	.	.	1	.	.	.	.	.	4	5	.	.
Madarosis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
Trichiasis	.	3	1	2	1	1	.	.	.	.	1	.	1	2	1	.	.	.	2	.	.	.	1	.	9	10	.	1
Entropion	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.
Ectropion	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Nævus	.	.	.	.	.	.	.	.	.	.
Injury of lid	.	.	.	.	.	.	.	.	.	.
Blow on brow; contraction of palpebral fissure.	.	.	.	.	.	.	.	.	.	.
Diseases of the Lachrymalor- gans:	1	.	.	.	.	.	.	.	1	. . .
Stillicidium	3	5	.	2	1	1	.	1	1	2 10 9 1 1 2 1 1 1 6 3
Dacryoeystitis	.	1	.	.	.	.	.	.	.	1 10 9 5 4 2 2 1 1 1 3
Diseases of the Orbit:										
Abscess in	.	1	.	.	.	.	.	1	.	. . .
Exophthalmos	.	1	.	.	.	.	.	.	1	. . .
Diseases of the Cornea:										
Superficial keratitis	5	2	1	.	2	1	.	.	.	7 4 9 10 2 2 1 4 22 12 8 1 1 2
Keratitis	.	5	.	1	1	.	1	2	.	. . .
Strumous keratitis	.	.	.	.	.	.	.	.	.	. . .
Pannus	.	.	.	.	.	.	.	.	.	. . .
Ulcer of cornea	2	5	.	1	3	1	1	2	4	. . .
Nebula	2	6	1	2	4	1	1	2	2	6 22 12 20 1 1 5 1 1 1
Leucoma	.	2	.	1	1	1	2	.	.	. . .
Vascular growth on	.	.	.	.	.	.	.	.	.	. . .
Staphyloma corneæ	.	.	.	.	.	.	.	.	.	. . .
Diseases of the Sclerotic:										
Eписcleritis	.	.	.	1	1	.	.	.	.	. . .
Sclerotitis and rheumatic ophtalmia	2	2	4	1	.	.	.	.	1	9 11 9 1 1 2 1 6 3
Staphyloma sclerotiçae	.	1	.	1	.	.	.	1	.	. . .
Posterior staphyloma	.	.	.	.	.	.	.	.	.	. . .
Diseases of the Iris :										
Coloboma	.	.	.	.	.	.	.	.	.	. . .
Iritis rheumatica	.	.	.	.	.	.	.	.	.	. . .
" syphilitica	1	1	.	.	1	2	1	.	.	3 7 2 2 1
Synechia anterior	.	.	.	.	1	.	.	.	.	. . .

Nature of disease.	Dec.		Jan.		Feb.		March.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Total out-patients.		Total in-patients.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the Iris—(<i>cont.</i>)																												
Synechia posterior . . .	.	.	.	.	1	.	.	.	1	.	.	2	1	2	.	.	.	.	.	.	.	.	.	.	3	6	.	1
Atresia . . . . .	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1
Mydriasis . . . . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diseases of the Choroid:																												
Choroiditis . . . . .	.	.	1	.	.	.	.	.	.	.	1	1	.	.	2	1	1	1	1	.	2	.	.	.	3	7	1	.
Irido-Choroiditis . . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2
Atrophy of the chorio-ca-																												
pillaris . . . . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Glaucoma . . . . .	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bright's disease . . . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diseases of the Lens:																												
Incipient cataract . . .	.	.	1	.	2	.	1	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	3	4	.	.
Capsular . . . . .	.	.	.	.	.	.	1	1	1	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	4	3	.	.
Capsulo-lenticular . . .	.	.	1	.	1	1	1	1	2	.	2	.	2	.	.	.	.	.	.	.	.	.	.	.	5	9	.	.
Traumatic	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	2	.	.
Dislocation of Lens . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.
Diseases of Refraction and																												
Accommodation:																												
Myopia	2	.	.	.	.	.	1	.	1	1	1	.	.	.	1	.	.	.	1	.	.	.	.	.	2	6	.	.
Hypermetropia	1	.	.	.	.	.	1	2	1	1	.	5	.	.	3	.	.	.	1	.	.	.	.	.	6	9	.	.
Asthenopia . . . . .	.	.	.	2	.	.	.	1	.	.	.	.	.	1	.	.	1	1	1	.	.	.	.	.	4	5	.	.
Diseases of the Muscles and																												
Neuroses:																												
Ptosis	1	.	1	.	1	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	1	.	.	.	1	5	.	.
Paralysis nervi oculo-mo-																												
tores . . . . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	1	.	.
" abducentis . . . . .	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	1	1	.	.
" facialis . . . . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Strabismus convergens .	2	1	1	2	.	.	1	.	1	.	2	.	.	.	.	.	.	.	.	.	1	.	.	.	5	10	1	3

[illegible]

XIX. PATHOLOGICAL OBSERVATIONS.

It is beyond the scope and intention of the following paper to give a detailed account, or even a short summary, of *all* the pathological appearances that have been observed in the post-mortem room during the past year. It is simply proposed to take the recorded accounts of the morbid appearances of patients who have died in the Hospital during 1867, as a guide, and to dwell on those points which seem of interest from a pathological point of view, or which appear in any way to throw light on any disputed or obscure question of morbid anatomy.

We shall commence with a consideration of the post-mortem appearances of the brain in those cases in which this organ was examined; and there are comparatively few which present any point worthy of note, the usual run of cases being classed under the heads of congestion and inflammation, combined with more or less effusion and softening, or else extravasations of blood due either to injury or disease, and with no features out of the common. They will, therefore, be disregarded. One case, however, it may be expedient to mention (7),* where death occurred from thrombosis, or plugging of the pulmonary vessels. Here the brain was found to be intensely congested, the whole of the white substance being of a pinkish hue, and the puncta vasculosa much increased in number. This state of the brain is the usual condition when death occurs from this cause, and is, no doubt, dependent on it.

With regard to extravasations of blood, there are one or two cases which deserve a passing notice. In one case (90),

* The numbers in brackets refer to the folio in the Hospital Post-mortem Book on which the case is described, and to which reference can be made.

both from the history and post-mortem appearances, it was evident that the clot had existed for some time, probably three days; and from its immense size, it seems curious that life should have been carried on for so long a time; as much smaller clots, *in the same situation*, have often been found to cause death in a few hours. Almost the whole of the middle lobe of the left hemisphere of the brain was destroyed. Anteriorly the clot extended in front of the ascending fissure of Sylvius; posteriorly to Rolando's fissure. It had destroyed the optic thalamus and corpus striatum, with the central parts of the brain, and had passed into the ventricles, and for some distance around the clot the brain was softened. The blood was of a peculiar chocolate-brown colour, and shreddy in appearance; the corpuscles were found to be broken up, but no hæmatine crystals could be discovered. The whole of the clot presented the same appearance; so that it was evident that the entire quantity of blood must have been poured out at the time of the fatal rupture, and not gradually; and this was further evidenced by the fact that aphasia was the first symptom denoting the attack, and, according to recent observation, the function of speech being situated in the posterior third of the inferior frontal convolution, which was situated at the extreme limit of the boundary of the clot, the blood must have reached here almost as soon as poured out; and it is therefore evident that the clot could not have been extending during the three days he remained alive after the aphasia set in.

As contrasted with this case is another (346), where death also resulted from *apoplexy*, and where the clot found after death was certainly not larger than a hazel-nut, and was situated in the post-third of the mid-frontal convolution. The woman was seen to fall in the street in a fit, and was immediately brought to the Hospital, where she died shortly after admission.

In one other case of extravasation of blood (204), the *position* of the clot was interesting, and occurred at a part where it is not usually found—namely, on the surface of the brain. The clot was of small size and of old standing, and was situated on the upper surface of the anterior lobe of the left side, where it had produced a slight depression in the

substance of the brain. The remainder of the brain was quite natural, with the exception that the vessels were atheromatous. In all probability this was not the immediate cause of death, since disease was found in other organs. A much more usual form of extravasation on the surface of the brain was found in the body of a man (133), who died suffering from symptoms of delirium tremens. Here the surface of both hemispheres, but more especially the left, was found to be studded over by a number of minute points of effusion, or ecchymoses, due to rupture of many minute vessels of the pia mater. The brain was also otherwise diseased; it was much congested, and its puncta increased in number; it was at the same time "wet" and cedematous, and loaded with fluid, and its cavities distended.

In two cases of *chorea* which were examined, the brain presented two very opposite appearances. In the one case it was very anæmic and pale (305); in the other it was much congested and full of blood (118); the sinuses also were full, and the central parts were much softened, and became easily broken down and "stringy" upon allowing a gentle stream of water to play upon them. This was the more noticeable because in both cases death appears to have occurred in the same way, and to have commenced in the lungs. In both instances the lungs were gorged with serum; the left side of the heart was contracted and empty, the right dilated and full of clot.

Two cases of *softening of the brain*, when contrasted together, present some interesting points of difference. In one case the pathology was clearly made out: it was a case of embolism; in the other the cause of the softening was not plain. In the one case the amount of softening was comparatively small, and was distinctly circumscribed; in the other it was of very considerable size, and presented no distinct point of demarcation, being gradually shaded-off into the healthy substance. In the first of the two cases (251) there was found to be old-standing valvular disease of the heart, with granular kidneys. On the auricular surface of the mitral valve were a number of bead-like fibrinous vegetations, and there were fibrinous blocks in the spleen and kidney; and therefore, though no plug could be found in the

cerebral vessels as far as they could be traced, it was a fair inference to suppose that a small mass of fibrin had been washed from off the mitral valve, and had been carried along in the circulation until eventually it was arrested, and formed an embolus or plug in one of the smaller cerebral vessels, and had thus led to softening, from malnutrition, of that portion of the brain supplied by this vessel; and this would account also for the circumscribed condition of the softening. The amount of brain-matter which had undergone this change did not exceed in size a walnut; and therefore the vessel which was plugged must necessarily have been a small one, and hence may easily have escaped observation or been overlooked. In the other case of softening (262) the cause was not so apparent, and the amount was very much greater, the whole of the middle lobe on the left side being more or less softened. The softening was greatest in the centre, but reached the surface of the brain along the margin of the horizontal fissure of Sylvius, in the temporo-sphenoid lobe. In the centre of the middle lobe the softening extended as high as to a level with the upper surface of the corpus callosum; in front, as far forwards as, possibly a little beyond, the fissure of Rolando. There was no apparent cause for this softening. The vessels of the brain were natural, and all the other organs were healthy, with the exception of slight granular degeneration of the kidney.

In connection with plugging of the cerebral vessels, the result of embolism, was an interesting case (254), as showing the efforts of nature to reëstablish a passage through the occluded vessel. There were vegetations found on the mitral valve, and it was remarked at the time that they were firmer and more adherent, and probably of older standing than is usually found. The left internal carotid was seen to be blocked by a firm, old fibrinous plug, which was closely adherent to the wall of the vessel. Upon laying open the vessel the plug was found to be tunnelled through its centre, so that a fine bristle could be passed through the middle of the clot, and it was evident that a small quantity of blood had been allowed to pass this way; there was, nevertheless, very considerable softening of the left hemisphere.

Two cases of circumscribed *abscess of the brain*, following

a slight injury of the head, are worthy of note. The two cases present some points of resemblance, but still were widely different. In both instances there was a scalp-wound, exposing the left frontal eminence, and in both the bone in this situation was necrosed, and the whole of the anterior lobe on the left side was converted into an abscess, filled with extremely foul and fœtid pus, with considerable bruising of the brain-substance around. But here the similarity ends; for in the one case (55) there was general inflammation of the whole of the brain-substance; in the other (313) there was none. In the former there was pus between the bone and dura mater, and in the cavity of the arachnoid, and the pus in these situations communicated with the abscess in the brain. There was pus smeared all over the surface of the hemisphere, and collected in considerable quantities in the subarachnoidean spaces at the base. The lining-membrane of the ventricles was covered with a layer of flocculent lymph, and their cavities full of sero-purulent fluid. The central parts of the brain were softened and broken down, and around the abscess was a considerable amount of yellow softening. In the other of the two cases there were none of these signs of general encephalitis; there was no arachnitis; no softening; no effusion in the ventricles; no lymph at the base. The abscess was distinctly circumscribed, and gave one the idea of being simply formed by the breaking-down of a limited portion of brain-substance, which had been bruised and injured by the accident. It is true there was a small collection of pus between the bone and dura mater, corresponding to the necrosed portion, but this membrane was uninjured, and the matter did not communicate with the arachnoid or the interior of the abscess.

Another case (131) of *circumscribed abscess* of the brain presented a very different appearance, and the cause of it could not be clearly made out, either from the post-mortem appearances, or from the history of the case; none being obtained except the fact that she had suffered from pain in the head for two years. The abscess was contained in the right optic thalamus, which was hollowed out into a large cavity, with extremely thin walls. It contained an ounce or an ounce and a half of thick, flaky, greenish pus, and was

lined internally by a distinct limitary membrane. It communicated by a small opening with the third ventricle, so that, on removing the brain, pus ran freely out of the infundibulum. There was no tubercle found in any part of the body. Death had evidently occurred from pyæmia, secondary deposits being found in the lungs; but the abscess in the brain was regarded more as the cause of the pyæmia than the pyæmia the cause of the abscess: in the first place, because it did not present the characters of a pyæmic abscess of the brain, and was not surrounded by a zone of congestion, as is usually found in these cases, the brain-substance around being in fact perfectly natural; and secondly, because it was evidently of too long standing for a secondary deposit, being surrounded by a well-defined and perfect membrane, which must evidently have been some time in forming, and was entirely different from the usual characteristics of a secondary abscess.

One specimen of *cancer of the base of the skull*, producing brain-symptoms, was of great interest (253). The cancer was situated behind the left posterior clinoid process, at the apex of the petrous portion of the temporal bone, and passed back as far as the internal auditory meatus. It was soft, white, and brain-like in appearance, and was of the size and shape of a hazel-nut. It had evidently commenced in the bone, which was quite soft for some distance around. It was situated under the dura mater, which was, however, perforated at the summit of the tumour. It implicated the Casserian ganglion; and on examination under the microscope, the fibres of the fifth nerve were found to be entirely destroyed, and no trace of nerve-structure remained, nothing but a confused mass of granular cells. It also, to a certain extent, implicated the sixth nerve, as it pierced the dura mater; this nerve was, however, healthy under the microscope, with the exception of some granular cells being found mixed up with the fibres. There was encephaloid deposit in the lungs.

We must not conclude this brief notice of some of the most interesting morbid appearances found in the brain without alluding to two cases where the brain presented a peculiar *honeycomb appearance* (198 and 293), from the for-

mation of a number of air-vesicles in its substance, evidently the result of decomposition.

The spine.—Comparatively few cases of disease of the spine came under notice. Some few instances of *softening*, occurring from very different causes, are recorded. In one case (49) of *tetanus*, there was a decided softened spot opposite the eighth dorsal vertebra. At the post-mortem examination there was no mark or abrasion in any part, though there was the history of a fall on the elbow a fortnight previously. In another case of *tetanus* which was examined, there was no softening in any part of the spine. In another instance (207), the softening was due to the effusion of a soft, gelatinous lymph in the arachnoid cavity, and also external to the cord, and extended from the fourth to the tenth dorsal vertebra. In this case, besides the softening, there was also in one spot a slight extravasation of blood into the substance of the cord. In two cases (52 and 293) the softening was due to *malignant deposit* in the theca of the cord; and in one case (292) to an *abscess* which had formed from caries of the bodies of two of the vertebra.

The lungs.—It is singular how seldom one finds the lungs in a really healthy condition in conducting a large number of post-mortem examinations. They are so extremely liable to become affected secondarily from disease in other organs, or even, indeed, to undergo certain changes in the act of dying or after death, that it only occasionally happens that we can record these organs as perfectly natural. They are more or less œdematous and infiltrated with fluid, especially in cardiac or renal disease; and this may be complicated with softening of the lung-tissue, apart from inflammation, when the act of death has been slow; or else they are emphysematous, a condition which often exists, in a minor degree, in cases where death commences in the lungs, and where it may be supposed to occur during the final respiratory efforts. They may also be more or less compressed and solidified by the pressure of fluid in the chest; this fluid occurring quite independently of any of the external signs of inflammation, and being generally the result of disease of the heart or kidneys. A large number of these cases of *hydro-*

thorax came under observation, and in all of them there was more or less extensive disease of these organs. Besides these, were a number of cases of effusion into the chest, where the fluid was evidently the result of inflammation, being to a certain extent turbid, and mixed with lymph or pus. The cause of this inflammation was in most instances quite palpable; in one case, however, it was somewhat singular, as it was supposed to have occurred by extension of inflammation from the peritoneum (47). After death the peritoneal sac contained a large quantity of pus, and there was a considerable amount of thick, flaky lymph in the pleural cavity. No disease of any organ existed beyond fatty degeneration of the kidney. Besides these cases of recent inflammation of the pleura, there were several cases where the serous cavity was full of pus, which had evidently existed there for some time. In two cases (108, 244) this pus had come from the bursting of a vomica into the pleural sac in cases of phthisis. In one instance (25), it was an old case of pleurisy of five months' standing, with a fistulous opening in the chest; in another, it was the result of cancerous deposit in the lung (239), which at one point reached the surface of the organ, while in another it was the result of an operation for scirrhus of the breast, the inflammation having extended through the thoracic parietes, and so caused death (298). In one instance, the pleural cavity contained blood mixed with serum (138). The case was one of phthisis, with hydro-thorax, for which paracentesis had been performed six days prior to his death, on account of the most urgent dyspnœa. In another case (108), blood mixed with pus was found in a cavity between the lower lobe of the right lung and the wall of the chest: it was found to communicate with a vomica in the lung itself, which had burst into the pleural sac and there formed a cavity for itself, and the blood had been poured out from a vessel which had given way into the vomica. The abscess had burrowed its way through the intercostal space between the sixth and seventh ribs, and was pointing externally on the wall of the chest.

There were eighteen cases in which *pyæmic abscesses* were found in the lungs after death, and they present some points worthy of note. With regard to the great frequency with which these secondary deposits appear in the lungs, it

may be mentioned that, of the eighteen cases, in only six was any secondary abscess found in any other viscus, and no case of pyæmia was examined in which abscesses were not found in the lungs. In twelve out of the eighteen cases, the original disease which had been the cause of the purulent infection was connected with bone, and in nine of these cases the disease of the bone was of an acute character; in the remaining three it was more chronic in its nature. The appearance of the deposits, in two cases, was somewhat peculiar, and in fact it was, at all events in one of them, somewhat doubtful whether they were true pyæmic abscesses or not. The case was one of simple fracture of the leg (128). After death, in the lower lobe of both lungs were found a number of patches of intense congestion, which looked at first sight like patches of pulmonary apoplexy, which they resembled in colour. They were, however, thought to be not distinctly circumscribed enough, being shaded-off into the surrounding parts, and they were not of a uniform hue throughout, the congestion being patchy. One of them was discovered to have some tendency to break down and soften in its centre; but no pus could be found. They were regarded as quite an early stage of secondary deposit, and this view received confirmation from the appearance of the injured limb. There was no effort of repair in the ends of the bones (the accident having occurred a month previously); on the contrary, they were softened, and could be cut with a knife; the cancellous tissue was absorbed, and the medullary cavity dilated and filled with a softened gelatinous material. The veins of the leg and thigh were filled with coagula, which, in places, was broken down and in a state of suppuration, and their lining membrane was thickened and rough. There can be little doubt, therefore, that this was a case of pyæmia. A somewhat similar condition of the lung was found in another case (131), only in this latter instance the disease had advanced one stage further. The lungs presented the same appearance of dark-red, somewhat-circumscribed patches of congestion; but on section, these patches were seen to be studded all over by a number of minute points of suppuration, where the lung-tissue was just on the point of breaking down.

Several examples of *pulmonary apoplexy* were found,

occurring in cases of heart-disease in every instance except one, directly to be mentioned. It is singular that in every instance the heart-disease principally affected the aortic orifice and semilunar valves; and that in every case, with one exception, the mitral valve was almost, if not quite, natural and free from disease. From a consideration of the cause of this morbid appearance, one would be inclined to imagine that old mitral disease would be more favourable to its production, by causing stagnation in the left auricle, and thus detaining the blood and producing pressure on the smaller pulmonary veins and capillaries. The case of pulmonary apoplexy (13), occurring independently of heart-disease, alluded to above, was that of a little girl, aged 15, who was admitted for diphtheria, from which she died. Upon post-mortem examination, both lungs were found to be studded all over with patches of pulmonary apoplexy. The bronchial tubes and trachea were intensely congested, and covered with spots of ecchymosis. The soft palate, the tonsils, and the upper part of the larynx, as far as the vocal cords, were in a foul gangrenous state, and covered over with sloughs, which extended some distance into their substance. There was no false membrane. Two explanations may be given of the manner in which the "apoplectic clots" might have been formed. They might have been caused by the rupture of the smaller arteries, consequent on pressure on them from congestion of the lungs; this congestion being due to non-arterialisation of the blood, from the impediment to respiration caused by the state of the fauces and larynx. This, however, is not probable, as we never get apoplexy of the lung from the congestion of bronchitis, where the same conditions would exist. It is more probable that the clots were the result of blood in the bronchial tubes running down into the air-cells. After death, the bronchial tubes were found to be intensely congested and ecchymosed. The explanation, therefore, would be, that blood was poured out from the rupture of minute vessels in this congested mucous membrane, and, passing down the tubes, had collected together and infiltrated small portions or lobules of the lung-tissue, and produced the appearance of pulmonary apoplexy.

The cases of *pneumonia* and *phthisis* presented no appear-

ances out of the common, and they are therefore passed over without comment, with the exception of one instance of consumption, which is interesting, as it illustrates a complication which may arise and cause death at a very early period of the disease. The case (332) was that of a girl, aged twenty, who was admitted suffering from severe hæmoptysis, from which she died. Upon post-mortem examination she presented by no means a phthisical aspect; the cheeks were round and plump, and the body well nourished and muscular. At the apex of the left lung were two small vomicæ, certainly not as large as hazel-nuts; into one of these a vessel of considerable size, in fact sufficiently large to admit an ordinary probe, could be seen opening. There was no clot in the orifice of the vessel, and apparently there had been no attempt at occlusion of it. With the exception of a very small amount of crude tubercle at the right apex, all the other organs of the body were natural.

The cases of *thrombosis* and *embolism* of the pulmonary vessels present several points of extreme interest. One case (7) is recorded as an instance of spontaneous coagulation in the pulmonary vessels. The patient, apparently in good health, was skating, when he suddenly fell, complained of faintness, and died in a minute. At the post-mortem examination, with the exception of an hydatid cyst of the liver, and slight atheroma of the arteries, all the viscera, though intensely congested, were perfectly healthy, except that the pulmonary arteries were plugged with firm, partially-decolorised clots. Six cases of true embolism of the lungs, the result of clots washed from a distance, are recorded. In four of these the plugs were evidently vegetations which had formed on the valves of the heart, and had become detached and washed along in the circulation; in another, in the same manner, the embolus was formed by the clotting of the blood in the meshes of the muscular trabeculæ of the heart, and was from thence carried into the general current of the blood. The remaining case presents some points of dissimilarity in the mode of the formation of the plug. It was suggested by Dr. Barnes, in the 4th vol. of the *Obstetrical Transactions*, that there is a condition of the blood immediately proceeding from the puerperal state which is favourable to the produc-

tion of clots in the uterine veins and veins of the lower extremities, and that it seems not unreasonable to assume that the disease takes its origin in these peripheral veins or their larger trunks, and is then carried to the right ventricle, and next transmitted to the pulmonary arterial branches. This view is borne out by the result of a post-mortem examination on the body of a woman (191) who was admitted with a severe attack of erythema nodosum and phlebitis, and who died suddenly from syncope. At the post-mortem examination both pulmonary arteries were found plugged with soft, irregularly-shaped clots of a pinkish colour, the right artery containing the larger clot. In the right ventricle were entangled one or two of the same clots, and the left femoral and iliac veins were completely occluded with the same material. The condition of the blocks in one case (147) deserves mention. At the apex of the left lung was a large abscess, the walls being formed by an extremely thin layer of pulmonary tissue, filled with exceedingly foul grumous pus and broken-down lung-tissue. In the lower part of the same lung were several small abscesses, filled with pus, and bounded by a distinct limitary membrane, and with no congestion around. In several of the ramifications of the pulmonary arteries, especially in those branches leading to the abscesses, there were decolorised clots, which were evidently of old standing, and which were adherent to the lining membrane of the vessel. This was especially demonstrated in the branch of the artery leading to the apex of the lung. In this artery there was a plug firmly wedged in the mouth of the vessel directly after its origin from the main trunk, and which looked exactly like some masses of fibrin which were found imbedded in the meshes of the columnæ carneæ of the right side of the heart.

Several cases of *cancer* of the lung came under notice; with the exception of two, in all it was secondary to a similar affection in another part. In the two cases of so-called primary cancer (239 and 330), the lung was the only organ affected. The disease had apparently commenced in the bronchial glands, and had extended into the parenchyma of the organs, inasmuch as it was collected in a mass around the root of the lung, encircling the bronchial tubes and blood-

vessels. In all the cases save one, where the form of the cancer was scirrhus, the disease was of the encephaloid variety.

There only remain to be mentioned two other cases of lung-affection, and one of these was a well-marked example of what has recently been styled *fibroid phthisis* (96). The lungs were extensively lobulated on their surface. This lobulation was due to a prolongation of fibrous striæ into the parenchymatous tissue of the lung; so that on section the lung was seen to be intersected in every direction by dense bands of fibrous tissue, which made the lung hard and difficult to cut; in between the bands the lung-tissue was extensively emphysematous, and hence the lobulated and peculiar honeycombed appearance of the organ.

A condition somewhat allied to this, but where we found the fibroid material deposited in masses, was discovered in another case; it was associated with tubercle. In this instance (236) both lungs were studded with miliary tubercle. At the posterior part of the upper lobe of the left lung a large cavity was found, filled with thick creamy pus. The walls of this cavity consisted of extremely thick and dense fibrous tissue. The pus could not be washed off the walls of this cavity, and here and there small nodules of inspissated pus were adherent to them. The lung-tissue around this cavity, save that it was studded with gray tubercle, was natural. At the lower part of the upper lobe of this left lung two or three nodules of about the size of hazel-nuts were found imbedded in the lung-substance, but still in contact with the pleura. They were round, circumscribed, yellowish, semi-transparent masses, with a little black deposit scattered here and there,—one or two of them in concentric circles. The lung-tissue around them was unaffected, save, as before said, by the tubercular deposit. Under the microscope these deposits presented a distinctly fibroid appearance; they were evidently in a state of degeneration, for in the whites and more transparent nodules the fibrous tissue was less distinct, and a large quantity of fat was seen. Two or three nodules, similar in character, were found in the upper lobe of the right lung and at its lower part. The fibrous tissue around the bronchi was enormously increased in quantity. In this case

there was no history of syphilis; nor could any post-mortem evidence of that disease be discovered.

The organs of circulation.—Comparatively few cases of disease of the heart, which came under observation, present any features out of the common, or call for any remark. It is unnecessary to allude to the ordinary forms of heart-disease, cases of which almost daily fall under our notice, in the following paper, which is intended merely to draw attention to those cases which seem to be rather different from the ordinary course of events. The cases of inflammation of the pericardium, of hypertrophy and atrophy of the heart, and for the most part of valvular disease, will therefore be entirely disregarded. There are, however, two or three instances of *valvular disease* which deserve a passing notice. One of these (171) was a case in which a large circumscribed mass, the size of a hazel-nut, was found deposited on one of the aortic semilunar valves; the mass was contained between the two layers of the endocardium which form the valve, and this membrane could be distinctly traced over it on both surfaces. Both from its naked eye and microscopical appearances it was believed to be atheroma. The other valves contained a considerable amount of the same deposit, though not in one large mass. The heart was much hypertrophied. In another case (245) a somewhat similar deposit had taken place, but was of much older standing, as it had become quite cretaceous. In this instance, a chalky deposit the size of a kidney-bean was found in the same situation on one of the aortic valves; the endocardium covering it was at one point ulcerated. The other aortic valves and the aorta were also atheromatous. Two patients were examined who had died with symptoms of *pyæmia*, and where, after death, secondary abscesses were found; in whom a deposit of an opaque material like semi-purulent lymph was found on the valves, and was regarded as the result of the *pyæmia*. In the one case (103) the patient had undergone excision of the knee, from the effects of which operation he had died. After death, secondary abscesses were found in the lungs, and on the aortic valves were seen large masses of a soft, ragged, opaque material, which could easily be scratched off with the nail, but left the surface of the valve

rough. In their centres these deposits were softened, broken down, and contained ill-formed pus-globules. The other case (11) was that of a boy, who was admitted into the Hospital with lupoid ulceration of the face, and died of pyæmia. After death, pyæmic abscesses were found in the lungs, recent lymph on the surface of the pericardium, and on the aortic valves similar deposits to those described in the former case. The other valves were natural.

Two cases may be contrasted together, as showing the two extremes to which dilatation or obstruction of the auriculo-ventricular orifice may proceed, compatible, if not with health, at all events with immunity from anything like active symptoms of mischief. In the one case (120) there was the history of rheumatism twenty years previously, and comparative health until six weeks before her decease. After death, the mitral valve was so contracted as scarcely to admit the tip of the little-finger. In the other case (175) there was no history of any previous illness, and in this the right auriculo-ventricular opening was dilated sufficiently to allow the passage of the entire hand through it.

Two cases were examined (7, 137) where the aortic valves were more or less deficient, whether the result of a congenital malformation, or of some secondary change, it is impossible to say. The portion which was wanting was that lunated part which is formed between the free margin of the valve and the upper border of the fibres which radiate from the corpus Aurantii to the attached margin—the part, in fact, where the valve is thinnest, and formed merely by the lining-membrane of the heart.

Several cases of *aneurism* came under notice; and there are some points worthy of note in connection with some of these. In the first place, three cases of sacculated aneurism of the arch of the aorta were examined. In all three cases the point at which the sac of the aneurism communicated with the vessel was the same, namely, at the junction of the ascending and transverse portions, just to the right of the origin of the innominate. In all of them, the opening was of about the same diameter, sufficiently large to admit a finger; but the condition of the aneurism in the three cases was very different. In one instance (10), the aneurism was

entirely cured, being quite solid, and filled throughout with laminated fibrin. The sac was of the size of a foetal head, and lay in the upper part of the thorax, above and to the right of the heart, and extending through the upper opening of the thorax. In the second case (82), there was not the slightest attempt at cure, and the aneurism was evidently in a state of progression; there was no laminated fibrin in its interior. In this case the tumour passed up behind the trachea, which it pressed upon and materially diminished in calibre. There was also some tubular dilatation of the arch of the aorta itself. In the third instance (304), there had evidently been some slight attempt at spontaneous cure, as there was a certain amount of fibrin deposited in its interior; but the sac, taking the same direction as in the last case, had contracted adhesions to the trachea, and an ulcerated opening having occurred between the two, the blood had found its way into the trachea, and so caused death. In the same way death was caused in another case (217) by the bursting of an aneurism of the innominate into the trachea. In another instance (17), rupture of an aneurism took place, causing almost instant death. This was an aneurism of the abdominal aorta. The sac was of very large size, filling the whole of the left iliac fossa, and protruding below Poupart's ligament, and forming a fluctuating swelling in the groin. It communicated with the abdominal aorta by an opening the size of a shilling.

In connection with the subject of disease of arteries may be mentioned two cases. One of these (4) was a case in which the vessels had undergone extensive atheromatous change. In the aorta, patches of atheroma were found as large as threepenny-pieces; some of these were softened and broken down in their centres, leaving patches of ulceration with ragged edges, and surrounded by considerable congestion. The other case (274) was also one of atheroma; the aorta throughout was very atheromatous, large deposits of this material being found all over its surface. On the lining-membrane were several small patches the size of peas, of a dark-red colour, and presenting, under the microscope, evidences of being altered blood. One of these had evidently become detached and carried along in the circulation until it

had been arrested in the popliteal artery, where it had formed an embolus or plug, and produced gangrene of the foot.

The liver.—Among the cases where some morbid condition of the liver existed, were two of *ecchymosis*, or minute extravasations of blood into the substance of the organ. One of these (72) was in a case of fractured ribs from severe injury; and the surface of the liver presented a very peculiar appearance, being covered all over by a number of small patches of extravasation of blood, varying in size from a millet-seed to a pea, and being for the most part situated just under the serous covering, which was in nowise injured. The structure of the organ beyond this was apparently natural. In the other case (325) the cause was very different. It was a case of peritonitis after the operation for strangulated hernia. Several cases of *abscess of the liver* came under observation; all of them, with one exception, were the result of pyæmia. In the one case (284), a large abscess was found, involving the left lobe of the liver, the diaphragm, and the lower lobe of the right lung. It was impossible to say, from the condition of the part, where the abscess had commenced; but it is probable that it commenced in the diaphragm, inasmuch as here the greatest amount of pus existed; in fact, there was here an abscess the size of a coconut. This abscess communicated by a very small opening with the abscess in the liver, which was about the size of a walnut. The upper wall of the abscess was formed by the under surface of the lung, which had been ulcerated and destroyed to the extent of about half an inch. The cavity was full of bile-stained pus, and the bronchial tubes of the right lung contained the same material.

The other cases of abscess of the liver, four in number, were all the result of pyæmia: in two cases occurring after scalp-wound, in one ulceration of the intestine, in one necrosis of the rib; and in all secondary deposits were found also in the lungs.

In connection with the subject of abscess may be mentioned a case (340) where a dense cicatrix was found on the anterior surface of the left lobe, and extending for some distance into the substance of the organ. It had evidently been

the result of loss of substance, as if from former suppuration ; but no history or clue to its cause could be obtained.

Several cases of *cirrhosis of the liver* occurred ; among them were some where the liver, though cirrhotic, was also enlarged and fatty ; in fact, that form of liver which is supposed to occur in those who drink of beer largely, in contradistinction to the small, contracted, and hob-nailed, or so-called gin-drinker's liver. This was notably the case in one instance (115), in a man who confessed that he was in the habit of drinking a large amount of beer daily. The liver was enlarged and nodulated ; it was hard, and difficult to cut, and the fibrous tissue was much increased, bands of it intersecting the structure in every direction ; in the interstices between the bands the liver was of a light colour, and very soft and fatty ; under the microscope almost all trace of the hepatic cell was lost, and was replaced by oil-globules, pigment, and biliary matter.

Of cases of *morbid growths*, or deposits, there were several examples, the most common, as would be expected, being *cancer*. Of this there were six instances. In one of these cases certainly (215), if not in two, the disease was idiopathic, and occurred as a primary affection in the organ itself. The liver was very large, and contained numerous masses of carcinoma, varying in size from a hazel-nut to an egg. In other places, the hepatic tissue, though apparently natural, was of a lighter colour than usual ; and this was found to be due, on microscopical examination, to an infiltration of cancer-cells throughout the lobules. The gall-bladder was unaffected, and no cancer was found in any other part. In one instance (101), the disease had most probably commenced in the gall-bladder, as the walls of this viscus were much thickened by cancerous material, and at its neck was a malignant mass of the size of an orange, which was beginning to soften in its centre. In two cases there was also found scirrhous of the pylorus, and in all probability the cancer of the liver was secondary to this ; in one case malignant deposit was also found in the theca of the cord ; and in the remaining case, encephaloid matter was found in the lungs and on the surface of the heart, but this was believed to be secondary to the formation in the liver, as apparently it was not so far advanced.

The form of the cancer was, in three of the cases, of the soft, encephaloid variety; in the other three it was scirrhus.

Three instances of deposit of *tubercle* in the liver came under notice, all in cases of acute tuberculosis. In two the deposit was also found in the other abdominal viscera, and had produced peritonitis, the immediate cause of death. In the other case death resulted from meningitis. For the most part, these deposits were situated under the serous covering of the viscus, and in Glisson's capsule, around the roots of the vessels.

The only other instance of morbid deposit of any interest was one of *syphilitic fibroid material*. The case (89) was one of great interest, occurring as it did in a patient suffering from general amyloid degeneration. The organ was adherent to the under-surface of the diaphragm by a number of firm, strong bands. The capsule was much thickened, and of an opaque, milky-white appearance, and on its surface presented a number of little pits or depressions. On section, it was of a pale-buff or fawn colour, dotted over with a number of minute points of congestion, and evidently infiltrated with the so-called waxy or lardaceous material. With iodine it gave a most characteristic reaction. In the centre of the right lobe was a deposit the size of a small orange, not very distinctly circumscribed, of a dusky-yellowish colour and firm consistence, somewhat resembling in appearance crude tubercle, but much harder and tougher; in its centre it was softened and broken down. It gave very little, if any, reaction with iodine. Under the microscope it showed traces of a fibroid structure, and was believed to be of syphilitic character.

An interesting condition of *gall-bladder* was found in a woman who died of phthisis (67). The cystic duct, just where it joins the hepatic duct, was blocked by a gall-stone, so as to render the former duct quite impervious; it did not, however, interfere with the passage of fluid through the hepatic duct; so that the whole of the bile, as soon as secreted, must have passed at once into the intestines without entering the reservoir for it. The gall-bladder and cystic duct behind the obstruction were much dilated, and full of

a perfectly clear limpid fluid. The skin was slightly jaundiced.

The spleen.—The cases in which the spleen was found to present any interesting form of disease are comparatively few. Still, however, there are some few points in connection with morbid lesions of this organ worthy of mention. Among other cases was one of *simple enlargement* of the spleen (258), but without history of ague, or symptoms of leucocythemia. The spleen was enormously enlarged, weighing 94 ounces, or more than thirteen times its ordinary weight; it filled up the whole of the left side of the abdomen, extending quite down into the iliac fossa. The enlargement appeared to be due to simple hypertrophy. The structure was firm and apparently healthy, with the exception that the fibrous trabeculæ were more marked and prominent than in an ordinary spleen.

It has been asserted by some authors that in *diphtheria* the spleen is found to be enlarged, softened, and dark-coloured, and especially characterised by an extreme distinctness and prominence of the Malpighian tufts. This was found to be the condition of the organ in a case of diphtheria which was examined after death (13). A somewhat similar condition of things was observed in several other cases, where the blood was poisoned from some cause or another, with this important difference, that whereas in the case of diphtheria the dark colour was uniform throughout the organ; in the other case the congestion was in patches, producing a rather peculiar appearance, the organ, on section, being seen to be of chocolate-colour, but presenting patches of a much darker colour, and looking almost like extravasations of blood. The cases in which this condition of spleen was found were, two of pyæmia, one of granular kidneys, one of acute tubal nephritis after scarlatina, and one of pneumonia.

In contrast to these cases may be mentioned one (135) of a man who died of phthisis, with hydro-thorax, in whom the spleen contained two or three patches of extravasated blood. Upon comparing the two, it would be impossible to mistake the one for the other, the extravasated blood-patches being darker, firmer, and more circumscribed than the patches simply arising from congestion.

Out of the eighteen cases of *pyæmia* examined, in only two instances was any secondary deposit found in the spleen: one a case of lupoid ulceration of the face; the other, a case of pyæmia occurring after delivery.

Eight cases came under notice where the spleen had undergone *amyloid degeneration*. In seven of these cases the organ gave a well-marked reaction with iodine; this reagent staining the prominent Malphigian tufts of a dark-brown colour. In the other case the viscus had all the appearance of an “amyloid spleen,” though it gave no reaction with iodine; and as other organs were distinctly waxy, it was a fair inference to suppose that this also was in like manner affected. The general appearance of the spleen in these cases was that it was much hardened and firm, and on section was seen to be studded over by a number of minute glistening bodies—the Malphigian tufts—about the size of pin-heads. In two cases the organ was also enlarged.

Three cases of *fibrinous blocks* in the spleen came under notice. In two they were evidently of old standing, and were in no manner connected with the cause of death. The other case (251) has already been referred to in connection with diseases of the brain. It was a case of embolism, with recent vegetations of the mitral valve, softening of the brain, and fibrinous blocks in the spleen and kidneys.

Two or three cases of *miliary tubercles* of the spleen occurred in cases of acute general tuberculosis; and one instance (155) in which several masses of yellowish-white, firm, opaque matter, resembling crude tubercle, were found scattered through the organ. The patient died of tuberculous meningitis. There was tubercle in the lungs, and the mesenteric glands were much enlarged by scrofulous deposit. The lymphatic glands were not affected.

The kidneys.—Out of 270 cases in which the kidneys were examined, in 127 these organs were found to be more or less diseased; and this number does not include many cases in which there was some slight deviation from the healthy condition, such as congestion, slight abnormal thickening or adhesion of the capsule, or other changes which can scarcely be characterised as a diseased state. Out of these 127 cases

of diseased kidney, 47 were in a more or less advanced stage of granular degeneration; 30 were in a state of tubal nephritis; 28 had undergone the amyloid change, and the remaining 23 presented examples of some of the other forms of disease to which the kidney is liable, and will be alluded to more in detail hereafter.

Granular kidney.—Forty-seven cases of granular kidney came under observation, and in 39 of these cases there was also disease of the heart; only eight instances being found where this condition of kidney existed uncomplicated with some change either in the valves or the structure of the heart—the result or the cause of the renal disease.

As far as could be ascertained, judging from the history of the case and the relative amount of disease in the two organs, it appears that the cardiac mischief was the primary disease in 11 instances, and that the granular condition of the kidney resulted therefrom; and that in the remaining 28 cases the disease of the kidney was the primary condition, and was the cause of the subsequent disease of the heart. This statement probably is not absolutely correct, as in one or two cases there is some doubt in which organ the disease first originated; but it may be taken as an approximation to the truth. With regard to the 36 cases in which the granular condition of the kidney was the primary disease, or existed independently of heart-disease, in five it occurred in gouty subjects; urate of soda being found in the inter-tubular structure and in the joints. In three cases it occurred in painters, or in persons exposed to the influence of lead. In the remaining cases the cause of the disease was not ascertained.

Thirty cases of *tubal nephritis* came under observation where the kidney was enlarged and the surface smooth and mottled. In 13 of these cases the disease was acute in its character, and principally occurred in cases in which some poison existed in the blood. In the other 17 cases the disease was more chronic in its nature.

Twenty-eight cases were examined in which the kidney had undergone the so-called *amyloid* or lardaceous degeneration, and in 24 of these there was suppuration in some part of the body, or presumptive evidence that suppuration had

formerly existed. The suppuration was from the following causes: In 9 cases from caries of bone; in 10 cases from tubercle and vomicae in the lungs; in 1 case from dysentery; in 1 case from cancerous ulceration, and in 3 cases from abscess connected with the abdominal viscera. Of the remaining 4 cases, though there was no evidence of suppuration in 2, there was tubercular deposit in the lungs and bronchial glands respectively. In one of the others the man died of pleuro-pneumonia; and in the remaining case of senile gangrene.

The remaining cases of disease of the kidney were either *cystic*, from stricture, calculus, or some other obstruction, *tuberculous*, or containing *fibrinous blocks*, and do not require special mention, with the exception of two cases. One of these was in a case of *embolism*, in which the kidneys presented a very peculiar appearance. They were rather increased in size, and ecchymosed on their surface, and in their interior presented a singular mottled appearance, which may be best compared to granite. This was found to be due to a multitude of minute points of extravasation of blood.

The remaining case was where one kidney was almost entirely *replaced by fat*. It was the right kidney, and only a portion of the pelvis remained, surrounded by what, to the naked eye, appeared to be the remains of kidney structure; but on examining this part with the microscope, little else save fat-globules and fibrous tissue could be seen. Here and there the fibrous tissue seemed to arrange itself in the form of a convoluted tube, but nothing like a real kidney-tube could be seen. The ureter was patent as far as the bladder, but surrounded with a thick layer of fat, this deposit becoming less as the ureter approached the bladder.

Bladder and urethra.—These organs presented very little to remark upon out of the ordinary course of disease of these parts. Two cases of *tuberculosis* of the bladder may, perhaps, be alluded to, as they illustrate two different stages of the disease. In the first instance (303) the mucous membrane was seen to be covered over by a number of little rounded elevations of a deep-red colour, some of them being as large as peas, and others smaller. Upon making a section

through them they were found to be little masses of crude tubercle, deposited in the submucous cellular tissue, and covered over by a highly vascular mucous membrane. In the other case (291) the disease was further advanced ; there were the same elevations on the mucous membrane, due to the same deposit beneath it ; but in many places these masses were ulcerated on their summit, so that the internal coat of the bladder presented a number of little rounded, excavated ulcers with indurated bases. The only other case deserving mention was one of *ulceration of the urethra*, occurring in a boy suffering from lupus (11). The mucous membrane of the orifice of the urethra was ulcerated for the extent of an inch, and the calibre of the canal diminished ; and as the ulcer was exactly similar to the lupoid ulceration of the face, and presented the same appearance, it was believed to be due to the same cause.

Organs of generation.—In this section there is only one case which requires any particular comment, and that is a case of a large fibrous tumour of the ovary. The tumour was removed from the body of a woman who died after an operation for strangulated hernia. It was connected with the left ovary, and was the size and shape of the human adult brain ; it was covered by an exceedingly thick and dense envelope, and consisted almost entirely of fibrous tissue.

THOMAS P. PICK.

REPORT OF THE MEDICAL CASES ADMITTED DURING THE YEAR 1867-68.

THE following report of the cases admitted into the Medical Wards of St. George's Hospital during the year 1867 is drawn up in accordance with that classification of disease which has been used in the former Reports. Notes of all the cases admitted have been kept, and the diseases entered under their separate headings. However anxious a registrar may be to note the symptoms in the different cases, it too frequently happens that errors of omission and of mistaken diagnosis occur, and take away much from the value of the observations. It therefore becomes a matter of much consideration in reporting the cases for the past year, how best to utilise that fund of information which ought to be made productive towards the advancement of the knowledge of disease. Seeing that various cases of great rarity are admitted into the London hospitals, it is much to be regretted that there is no system of registering publicly the cases admitted from time to time; as a return of the cases might be made from the registers of the hospitals, and without very great trouble. By such means a student would be able to extend his knowledge of rare cases by personal observation, which is more valuable to the individual than the perusal of records, however elaborate in detail.

In the following Report a short account has been given of some rare forms of disease, and such statistics of certain diseases as could fairly be deduced from the number of cases admitted.

The year 1867 was not remarkable for any epidemic in the neighbourhood of the Hospital. No cases of cholera were admitted, and fewer cases of continued fever than in the previous year. More than twice as many cases of erysipelas were under treatment. The form of rheumatism does not seem to have been more acute nor the number of cases more numerous; of the other forms of disease the same remark may be made; and a comparison of the admissions during the years 1866-67 shows that the number of each disease varies very slightly.

Of the method of registration adopted at this Hospital I may say, without wishing in any way to detract from the laborious industry which is shown in other London hospitals, that its simplicity is its best recommendation; that the notes of cases, such as they may be, are available and easily intelligible to any who wish to refer to cases that have come into the Hospital. In other registers to which I have had cause to refer, a more laborious plan of entering cases has presented some obstacles to the required information.

Continued Fevers.—Few cases of fever came under notice. Eight cases of typhus were admitted, four of which proved fatal; two of the fatal cases being complicated with delirium tremens, two with disease of the kidneys.

Twenty-one cases of typhoid were admitted, and of these three died; one from perforation of the intestine and peritonitis. Some of these cases of fever showed a tendency to relapse; in seven cases the patients were subject to very marked symptoms of relapse, which in one case proved fatal.

Of simple fever ten cases were admitted, which were neither complicated nor fatal.

Ten cases of measles are recorded, two of which were fatal; one being complicated with pleuropneumonia and nephritis.

Of twenty-four cases of scarlatina, one was followed by nephritis; none were fatal.

Six cases of smallpox were admitted, and were sent out as soon as the disease was declared.

It may be worth mentioning that it has very rarely happened (during the period of my registrarship) that such cases have been admitted without communicating the disease to others, either in the Hospital or by means of visitors outside.

Of twenty-four cases of erysipelas, six were fatal.

Of seven cases of intermittent fever, two were quotidian in type, two tertian, three irregular; of these one was fatal, and complicated by granular kidneys, and consequent œdema of the glottis. This case is worth recording from the rapidity of the fatal symptoms.

Ague. Granular Kidneys. Œdema Glottidis.—A man æt. 60 was admitted with irregular ague. Under treatment the symptoms subsided. His urine was of low specific gravity, but free from albumen; he was apparently in such good condition that he was to be sent out. On the morning of his death he was up and about the ward; at 2 P.M. he began to complain of shivering and sore throat, and when seen at 3 I found him with a hot skin, very tremulous, shaking all over, and complaining of difficulty in swallowing; his voice was not husky nor altered in quality; his pulse was very frequent. He rapidly grew worse from this time, and died at 5 P.M., with symptoms of œdema of the glottis.

After death the kidneys were found to be granular and cystic, and the secreting structure was diminished. There was excessive œdema of the glottis, as well as of the true and false vocal chords; but the œdema did not extend below the former.

Rheumatism.—The subjoined table gives an analysis of all the cases of acute rheumatism which were treated during the year in the Hospital. Subacute cases have not been included, the cases that have been tabulated having given some evidence of acuteness of symptoms, either in the form of joint-inflammation or of heart-mischief. The treatment adopted in every case has been the administration of large doses of the bicarbonate and citrate of potash (3j.-3jss. of the former to ʒj.-3ss. of the latter), with acetate of ammonia in the form of an effervescing

draught with citric acid every four hours. The dose of potash is diminished as soon as the urine is made alkaline; and the drug is continued until all evidence of joint-mischief is abated. The diet to such patients consists of milk and beef-tea during the acute symptoms; a more liberal diet being afterwards given when these symptoms have subsided. From the table it may easily be calculated that the average number of days that a patient with acute rheumatism remained in the Hospital was thirty-one.

In five cases out of the fifty-six pericarditis occurred after the patient was admitted; in one of these an endocardial murmur remained persistent on dismissal of the patient; in one other case endocarditis occurred, and also left permanent mischief to the heart.

Of subacute cases, forty-nine were under treatment; and six of these were complicated with old heart-disease, one with quinsy.

Eighteen cases of chronic rheumatism were under treatment; and of these two were complicated with heart-disease, one with disease of the kidneys. One patient was pregnant, and delivered in the house, and was subsequently attacked with inflammation and ulceration of cartilage.

Rheumatoid arthritis (osteo-arthritis, or rheumatic gout) was observed in forty-one cases, none of which were fatal; gonorrhœal rheumatism in sixteen cases; rheumatic pains of syphilitic character in thirteen; and scarlatinal rheumatism in two. Of these none were fatal.

Gout.—It seems to be impossible in the present state of knowledge to separate into distinct groups by any decisive symptom some forms of gout and rheumatism; if, indeed, any marked line of distinction ought to be made. From the great variety in joint-mischief which these diseases exhibit, the question seems to be, whether there is any boundary-line at which one disease may be said to begin and the other to end; the symptoms of acute gout are, however, easily recognised, and such cases, of which there could be little doubt, have been tabulated with reference to the presence of tophi in the ears and the concurrence of albuminuria. Of twenty-two cases (two of which occurred in women) two were fatal; in fifteen cases albumen was found in the urine; in ten tophi were found in the ears; three only of the patients were painters: in one case chalk-stones were deposited in the hands, though none were found in the ears.

Chorea.—The cases of chorea admitted during the past year have likewise been tabulated: nineteen cases were under treatment; in four cases only was any history of rheumatism given. Four cases were sent out well; two of these were treated with gradually-increasing doses of sulphate of zinc, one with bromide of potassium; one had scarlatina, after which the choræic symptoms disappeared.

Two cases of chorea occurred in pregnant women: one of these died; the other miscarried, but subsequently did well.

In eight cases the violence of the symptoms was much abated; four under the use of zinc, one with bromide of potassium, and three with

iron. Four were sent out unimproved; and besides the fatal case above mentioned, one proved fatal without complication.

Hæmorrhage.—Two cases of severe epistaxis were admitted, one of which proved fatal from an attack of erysipelas, and oedema of the larynx. In this man, the urine was not albuminous; the liver was found to be fatty, and the kidneys coarse and congested, the secreting structure diminished. The other case of epistaxis was a result of general purpura.

Of hæmoptysis nine cases were under treatment. Three of these cases died; in all of them tubercles of the lungs were present; one was found to have disease of the heart, one of the kidney, and one enlarged liver.

Of four cases of hæmaturia none were fatal. One case of fatal hæmorrhage from extensive arterial disease deserves to be recorded.

A man æt. 26 was admitted, with the following history. He had suffered from rheumatic fever when 14 years old. Two years before admission he was seized with pain in the occiput, followed in two weeks by sudden numbness of the thumb and two first fingers of the right-hand. One month before admission he was again seized with pain at the back of the head, followed by dropping of the right wrist, and pain in the elbow, back, and abdomen. On admission he was pale and anæmic, with pearly eyes. His right-hand was flexed, and he could not extend it; and there was considerable numbness of all the fingers, especially marked in those supplied by the ulnar nerve. On the inner side of the humerus there was some ecchymosis, with considerable tenseness of the muscles. This led to a diagnosis: the heart was acting with considerable violence and irregularity; the pulse was soft and intermittent; there was a rough murmur accompanying the first sound of the heart at the apex, and an exocardial murmur at the same time; there was some consolidation of the right lung, with deficient breathing. He had been subject to profuse sweats, and had been getting very thin. The urine was clear, with some albumen, s. g. 1014; no blood-casts were found under the microscope, but some minute crystals of hæmatin. He complained of much pain in the belly in the right side just over the region of the right kidney, which was aggravated by pressure. He was getting out of bed on the day after admission, when he was seized with alarming faintness, and complained of much pain in the bowels. He was put back to bed at once, but never rallied, and died in a very short time. The arterial system was found to be extensively atheromatous. The coronary arteries were so much diseased that they had given way in two places, and the pericardium was full of blood. The right kidney was found infiltrated with blood, and with a recent extravasation into the substance. Two small aneurisms were found, connected with small branches of the brachial artery.

Purpura.—Four cases of purpura were under treatment: one was associated with dropsy and disease of the heart, two with disease of the kidneys; these two cases proved fatal. Of the diseases of vessels, two were cases of phlegmasia dolens, neither fatal. Of eleven cases of

aneurysm, two were fatal in the house; one case died shortly after leaving the Hospital. Six were cases of aneurysm involving the ascending portion of the aorta; one of these was fatal from ulceration into the trachea, the result of a large sacculated aneurysm below the innominate. Three were cases of aneurysm of the innominate, two of which were fatal, one by the aneurysm bursting into the trachea; in the other the diagnosis was verified by an examination made after the patient had left the Hospital. Two were cases of abdominal aneurysm; neither fatal.

Phlebitis.—Of the cases of phlebitis admitted (ten in number), two were associated with anæmia; two were accompanied by erythema nodosum; one of these was fatal from embolism: two followed miscarriage; of these one was fatal, the patient dying as soon as she reached home, with all the symptoms of pyæmia; one other case proved fatal from embolism; and of two, occurring in men, one followed an attack of erysipelas, the other was the result of a blow; neither of these was fatal.

Phlebitis. Erythema nodosum. Embolism.—Jane W., æt. 35, had suffered from rheumatism nine years before admission. She was attacked with phlebitis of left leg three months before admission, which was followed by erythema nodosum. When she came into hospital her left leg was much swelled; there was some pleuropneumonia of the right lung; the heart's action was very rapid, and the sounds were reduplicated and transmitted over to the right side. In the evening she was seized with severe faintness, and the heart's action was impeded, and tumultuous friction was discovered the following day.

Seven days after admission she was seized with a sudden spasmodic attack of dyspnœa, and died almost immediately.

The pulmonary vessels were found plugged with soft irregularly-shaped clots of a pinkish colour. The pericardium was covered with lymph, and in the right ventricle were entangled several pinkish clots.

An old colourless block was found in the left kidney; the left femoral and external iliac veins contained a large long clot adherent to the walls of the vessel.

The patches of erythema nodosum had in places broken down into pus.

Anne T., æt. 25, was seized on the 14th of June with phlebitis, and on admission the left leg was found to be much swelled. She seemed in little pain, and no anxiety. She continued much in the same state until the 21st, when mischief was detected in the heart, and she died very suddenly of symptoms of embolism.

Both pulmonary arteries contained a firm, partially decolorised clot; clots were also found in the veins of the legs.

James D., æt. 20, labourer: had been ill with pains in the limbs, accompanied with swelling; from this he recovered, but caught cold five weeks before admission. He was then seized with pains in the loins, and œdema of the legs, with vomiting. He had, however, it appeared, had swelling of the face previously for two months. On admission, he

was cachectic and sallow; his legs were oedematous; the urine was very dark, and contained a large quantity of albumen; and very fine, clear, and narrow casts, with a few blood-globules, were found under the microscope, s. g. 1025. Noisy sibilant râles were heard all over the lungs, especially on the left side; dull percussion at left apex and right base. He was admitted on the 17th of April.

On the 22d it was observed that the heart's action was very irregular; the pulse was intermitting and irregular; and a mitral murmur was heard with the first sound, with pleural friction over the heart. On the 7th May, his feet were much swelled, and he began to spit up blood; the heart was much enlarged, and he complained of præcordial pain. On the 8th he continued spitting blood of bright-red colour, and apparently from the lungs. Very impulsive action of the heart. Subsequently a double mitral murmur, and an aortic obstructive murmur, were detected. He continued in this condition for some days, occasionally being seized with faintness, getting cold and pulseless, and with all the symptoms of approaching death. He died on the 8th of June, his face being very purple at the time of death.

After death decoloured clots were found in the ramifications of the pulmonary arteries, especially in branches leading to abscesses, which were found at the apex of the right lung and at the base. The left lung contained several fibrinous blocks and one small abscess, with some flaky lymph on the surface of the pleura.

The heart was semi-contracted, and contained some decoloured clots.

The auricular surface of the mitral valve was fringed by a row of bead-like vegetations, which could be easily scraped off.

In the meshes of the muscular fibres of the right ventricle were a number of little rounded masses of completely decolorised fibrin, quite loose, and only kept in their place by the muscular bands.

One of them of large size, in the right auricular appendix, was softened and broken down.

The kidneys were in an early stage of granular degeneration.

Hemiplegia.—Twenty-eight cases of hemiplegia were admitted, three of which proved fatal. Of the total number, twelve patients were hemiplegic on the left side; and in one case only (a left-handed boy) was the paralysis accompanied with aphasia; in none of the other cases was there any difficulty of articulation. Of these cases of left hemiplegia, one died, one became maniacal, five were sent out improved, and in five the symptoms were unaltered.

Of the other sixteen cases of right hemiplegia, eight were affected with difficulty of speech; in six the degree of aphasia was great. Of these cases, two died, eight were relieved, six were sent out in the same condition as on admission.

Anne T., æt. 20, was admitted with a history of paralysis of three months' duration. The paralysis, which at first involved only the right facial nerve, was reported to have come on suddenly in the night. When admitted she could shut neither eyelid; there was fulness and immobility of the right side of the face, and of the left to a less extent;

the tongue was protruded to the right side ; there was no loss of sensibility ; she could not close her lips ; the veins about the nose and of the left side of the neck were full, the heart's action increased ; an enlarged gland of two years' standing was found in the neck. She was treated with cod-liver oil, and improved in general health. It was subsequently ascertained that she died about two weeks after leaving the Hospital.

Diseases of the Lungs.—The cases of pneumonia will be found tabulated in the same way as in the last volume of these Reports.

Two cases of pneumothorax were admitted ; both died, and in both the right side was affected.

Of three cases of empyema, two were fatal, and of these one was associated with large smooth kidneys, the other with tubercle. The case that recovered was that of a young lad who was admitted with symptoms of empyema, which was supposed to be the result of diseased bone. Paracentesis was performed, and the lad ultimately made a good recovery.

Four cases of abscess of the lung proved fatal ; two of these were pneumonic, two tubercular.

A patient was admitted with symptoms of phthisis, and died. At the post-mortem examination the following appearances were observed :

Both lungs were studded with miliary tubercles ; at the posterior part of the upper lobe of the left lung a large cavity was found filled with thick creamy pus. The walls of this cavity consisted of extremely thick and dense fibrous tissue. At the lower part of the upper lobe of this lung two or three nodules of about the size of hazel-nuts were found imbedded in the lung-substance. They were round, circumscribed, yellowish, semi-transparent masses, with a little black deposit scattered here and there ; one or two of them were in concentric circles ; under the microscope these deposits presented a distinctly fibroid appearance. Two or three nodules similar in character were found in the upper lobe of the right lung at its lower part. The apex of the right lung was riddled with vomicæ. The larynx and penis were examined, but no marks of syphilis discovered.

One fatal case of hæmatothorax was under treatment ; a vomica was found in the lower part of the right lung, which had involved a small vessel, and a considerable quantity of blood had been effused into the thorax.

Of 104 cases of phthisis pulmonum, sixty-three were males, forty-one females. The lungs were affected in the following manner : in twenty-three cases the left lung was found to contain solid tubercle ; in fourteen cases the tubercles in this lung were found softened, in twenty-six the tubercles had broken down and formed vomicæ.

On comparing the condition of the right lung, it was found that in thirty-seven the tubercles were in a solid condition, in eleven the tubercles were breaking down, and in thirty vomicæ were formed.

Both lungs were diseased in forty-six cases. In fourteen cases the right lung contained the more and more advanced tubercles, the left lung in ten cases ; in the others the comparison could not be fairly made.

Where only one lung was diseased, the right was affected in thirty cases, the left in twenty-three cases. Of the whole number of cases, thirty-five proved fatal, six were sent out in a worse condition than on admission, two were not relieved, sixty-one were dismissed improved.

The following are some details of the cases of morbid growths admitted into the medical wards.

In eleven cases the uterus was involved ; three of these proved fatal.

In nineteen cases the growth occupied some part of the abdomen ; nine of these cases died.

In three cases the œsophagus was the seat of malignant deposit ; of these two died. The pylorus was involved in two cases, both of which were fatal.

One case of malignant disease of the bones of the skull proved fatal.

Two cases of malignant disease of the spine, both of which were fatal ; and two cases of malignant disease of the thorax, one of which was fatal, were also admitted.

Enlarged Cervical and Thoracic Glands, probably malignant.—George C., æt. 42, was admitted, with the following history and symptoms. Sixteen weeks before admission, after an accident, he was attacked with bronchitis, and at the end of the first week he found a swelling in the right side of the neck, which involved in a very short time the left side also. On examination, he was found to be very much swelled about the neck ; the cervical glands on both sides formed clusters of hard nodular masses, involving and pressing on the trachea, the voice being stridulous. The axillary glands were also enlarged. There was considerable dulness of percussion over the sternum, and especially to the right side, before and behind, with bronchial breathing and bronchophony at the upper part. He was liable to occasional spasmodic attacks of dyspnoea. During his stay in the Hospital it was observed that the veins of the neck and face were more prominent and enlarged, and subsequently the face became puffy, and he suffered from dysphagia. He left the Hospital in this condition.

James B., æt. 28, a painter, had enjoyed very good health until four months before admission, when he was attacked with hæmoptysis ; this continued for a week, and was accompanied by a little pain in the right side. Two months before admission he was in fair condition ; but five weeks before coming into the Hospital he suffered much from cough, and pain in the region of the right lung close to the spine. He was in bed two weeks, and at the end of this time his face began to swell. On admission he was suffering from orthopnoea and dyspnoea, with hoarse, croupy sounds of breathing ; the veins of the thorax were much distended, and there was decided fulness of the right side of the chest, with loss of motion of the ribs ; very dull percussion was found all over the right lung and under the sternum ; a slight amount of breathing was heard at the back, and even in front ; the heart's sounds were distant, no murmur was detected ; pulse rapid ; the right side of the face was swelled ; pupils equally dilated, spectra gray and thick ; urine loaded with lithates. His breathing became more rapid, and he stooped forward to get his breath. He became rapidly worse, the dyspnoea being

very harassing. No further examination was made, and he died suddenly in twelve days after admission.

After death the lung throughout its extent, with the exception of a small portion of lung-tissue behind, was occupied by an enormous mass of encephaloid matter, breaking down and suppurating in the centre; it extended rather over to the left side, occupying the bronchial glands, and pressing on the trachea. The surface of the heart was covered with recent lymph.

Cancer of Liver, Lung, and Theca of Cord.—John F., æt. 43, was admitted on the 3d of January. He was a gardener, and had enjoyed very good health until three years before admission, when he was attacked with bronchitis. The illness for which he was admitted was of three months' standing; the first symptoms were an attack of diarrhoea, followed by pain in the left flank, and extending to the spine; during this time there was no difficulty in passing water, but the urine was high-coloured and thick. Eight days before admission he felt numbness of the legs, which was followed in two days by complete paraplegia. When admitted he was paraplegic, in a state of much cachexia, face purple; and he had a large bed-sore on the sacrum of a very unhealthy look; the liver was enlarged, but no nodules were detected. He had no power at all in the legs; sensibility was very much diminished, and eventually quite absent, and no reflex action was exhibited on irritating the soles of the feet; the urine, which was drawn off, was free from albumen. He gradually sank, and died on the 3d of March.

After death, several small deposits of cancer were found in the base of the right lung.

The liver was large, nodulated on the surface, and contained cancer-nodules, some as large as a walnut.

On removing the laminae of the vertebræ, a deposit of the same material was found between the bone and dura mater, extending from the eighth to the eleventh dorsal vertebra. The bone was infiltrated with similar matter. The cord corresponding to this position was softened and broken down, and nearly destroyed. Below this, on the surface of the cord, were seen two or three minute specks of the same deposit.

On making a longitudinal section in its interior, the cord was seen to be softened to a much greater extent.

Agnes S., æt. 15, a delicate child, had been in good health until three weeks before admission (October 19th), when she was pushed against a wall, and hit the lower ribs of the left side. In two or three days a swelling over the lower ribs was observed, accompanied with pain in the back, which continued for two weeks. On the 18th she went to a dispensary for relief from the pain, and after walking, though with much difficulty, she found on arriving home that her left leg was partially paralysed, but there was no pain in the leg. She suffered extreme pain in the back that night, and had no rest; during the night the right leg became paralysed. She had menstruated once, one month before admission. When admitted she was suffering the most intense pain in the back; there was complete paralysis of the

legs and below the thorax; all the motions were passed under her, and there was complete paralysis of the legs and the muscles below the thorax; she was flushed; the heart's sounds were loud, its action rapid; the urine was acid with lithates; the tongue slightly coated with short white epithelium; there was effusion into the left knee, with distension of the veins; on the left side of the thorax, apparently connected with the rib, was a small, globular fluctuating swelling the size of a walnut. Pulse 108; temp. 102. The tumour in the ribs was opened, and found to contain bloody serum; but from this time rapidly grew a fungous growth which revealed the true nature of the spinal disease. Throughout her illness she suffered the most intense agony, which was horrible even to look at. On the 11th of November a new tumour was observed growing from the thigh. She lingered on until released by death on the 16th of November.

After death a large mass of encephaloid deposit was found in the spinal canal external to the thread, and extending from the second to the eighth dorsal vertebra, and also another and smaller at the lower part over the cauda equina. The cord in the situation of the upper deposit was much softened.

The lungs were studded with large masses of encephaloid deposit. In the left pleural cavity was a mass of the same deposit the size of a foetal head, which had worked its way through the walls of the chest and formed the fungous mass noticed externally.

There was a large malignant mass connected with the left femur.

Of the diseases of the abdomen one unique case deserves to be placed on record.

The man, æt. 39, was a plasterer, and had been ill three months. He attributed the commencement of the illness to a fall from a scaffold; from the effects of this he recovered sufficiently to be able to go to work two months before admission. But he was unable to continue at work, and he soon began to reject food, vomiting frequently. He had also suffered from sore mouth. When admitted he was thin, cachectic, pale, and sallow; there was very little fat on the body, and a putty-like consistence of skin; his breath was faint and sickening, and might be likened to the smell of old hay; the legs were œdematous, the left more than the right; dull percussion was detected at the base of the left lung, with symptoms of fluid; very little breathing was audible here; he had no sickness, and he complained of pain only in the left leg. The urine was pale, but not albuminous. No satisfactory diagnosis was made. He remained in the Hospital two months, and two weeks before his death he was seized with symptoms of pyæmia, from which he subsequently sank.

After death a foul abscess was found below the diaphragm, the other sides confining it being formed by the stomach and peritoneal adhesions. No communication was discovered between the stomach and the abscess, which contained very foetid pus, and a number of large calcareous plates which were in appearance and size like small oyster-shells.

The liver and kidneys were found in a state of amyloid degeneration.

The symptoms of pericarditis, though frequently overlooked from the transience of the preliminary friction, yet once detected are generally very decided; and the duration from inflammation to absorption may be fairly estimated within the limits of hours; but few attempts have been made, from the collection of a large number of statistics, to arrive at any distinct conclusions. Are students still to be taught that it is necessary to treat this symptom with some particular drug; with mercury, as some would say; with leeches and blisters, as others insist; with opium, with alkalies, without statistics to appeal to? It is true that a very large number of statistics is necessary before reliance can be placed in them; but surely the more reason for collecting statistics at once.

For my own part, it seems to me that pericarditis runs its course in spite of treatment; and its persistence, though limited to not very many days, varies under all methods.

Of nine cases of pericarditis due to rheumatism, all of which recovered, in one the attack, which was slight, lasted three days under alkaline treatment; in two it lasted ten days with a treatment of calomel and opium and alkalies in one case, and mercury and opium in the other; in one, twelve days with alkalies and leeches; in two, thirteen days with mercury and opium; in one, fifteen days with leeches and opium; in two, twenty days with alkalies and blisters in one case, with alkalies and calomel and opium in the other. It follows that an attack of pericarditis is of very varying duration; and if to this be added the observation that pericarditis often (under any treatment) results in complete recovery, on what grounds are we to recommend a certain remedy for this disease?

Diseases of the Liver.—Four cases of abscess were admitted. Three of these were fatal; one patient was admitted twice, the abscess being much larger and increasing; in this case the diagnosis has not yet been confirmed. Of the other cases, one was a case of secondary abscesses of the liver from pyæmia, the primary source of pus being an abscess of the lung (vomica?), which had burst into the pleura, and made its way by burrowing through the intercostal space between the sixth and seventh ribs, and pointed externally on the wall of the chest. One was a case of a large abscess of the liver, followed by secondary abscesses, verified by post-mortem examination.

The third fatal case was rather remarkable, and from the train of symptoms and the appearances found after death seemed to have been in the first instance a case of diaphragmatic abscess, burrowing into the liver and lung.

Thomas B., æt. 30, a bailiff, was admitted into the Hospital on the 6th of June 1866. His illness dated from the beginning of March, with general pains, especially in the region of the liver, with fever and some delirium at night, but no rigors. After one month he had pain in the right side, much increased by inspiration, with decubitus on the left side only. When admitted in June he was pale, complained of pain in the

right side; there was very decided dulness on percussion over the lower part of the right lung in front below the nipple, with increased vocal resonance, but no vesicular breathing, and a wooden timbre to the voice; the liver was thrown down a little, and there was considerable pain on pressing the organ against the diaphragm.

It was believed then that he was suffering from inflammation involving the liver, diaphragm, and lung. He went out in a short time with the symptoms unaltered.

After leaving, he remained pretty well, and was able to do his work up to the week of re-admission. One month before this, he felt, he said, a fulness referred to the region of the liver, and began to spit up nasty green stuff.

On the 11th of October (1867), as he was in the field, he spat up a quantity of bilious matter. He then applied for relief at the Hospital, and was admitted on the 22d of October. He had never been jaundiced; he was very much emaciated, eyes deeply sunken; he had a constant short hacking cough; spat up matter like egg and brandy and containing bile, and he was in so exhausted a condition that a passing examination only was made. At the base of the right lung, behind and quite low down, gurglings and cavernous breathing were heard, and there was marked tympanitic resonance on percussion; above this the lung was consolidated, and there was some pain in pressing the liver upwards.

The liver was lower than natural, but the lower margin was thin; no breathing was heard at the upper part of the right lung, and there was some resonance of percussion. The left lung was doing the work of both lungs, was fully distended, and overlapped the heart. There was some swelling and tenderness under the ribs of the right side below the nipple. He was treated with stimulants, but he gradually sank, and died on the 8th of November.

The following were the notes of the post-mortem appearance, made by the Curator.

The body was emaciated.

There were universal soft adhesions throughout the right pleural cavity. The lower lobe of the right lung was consolidated, sinking in water; it was quite rotten, breaking down under the finger, and of a yellowish colour, in consequence of the bronchial tubes being filled with a bilious-looking fluid. On the under surface of the lower lobe, which was intimately adherent to the diaphragm, was a small ulcerated opening which extended into the lung for the distance of about half an inch; this fistula passed directly into an abscess which had formed in the substance of the diaphragm. The left lung presented one or two broken-down patches, surrounded by congestion, which looked like secondary deposits.

In the substance of the diaphragm was an abscess the size of a coconut, full of bile-stained pus, which opened into the lung above, and into a small abscess (the size of a walnut) in the liver below.

The kidneys were soft and fatty.

Cysts (? Hydatids) of Abdomen.—Alfred L., æt. 29, was admitted on

the 16th of October, with the following history and symptoms: For five months he had been suffering from a gradually-increasing tumour of the belly; it was first observed at the lower part and right side of the belly; he suffered no pain nor inconvenience from it. On admission he seemed in good health; his belly was much swelled, and was occupied by two or three globular elevations, which were apparently connected with the liver, and did not extend over to the left side. Distinct tense fluctuation was perceptible, as if the fluid fully distended the sacs. Measure round the belly 40 inches. On the 23d an exploratory needle was introduced, and a small amount of purulent greenish fluid drawn off, which was subsequently carefully examined, but no hooklets were discovered. In half an hour symptoms of acute peritonitis came on, and he suffered very severely for eight days.

After recovery it was determined to try the caustic potash, and a sore was made; the opening, however, was anticipated by a natural evacuation of some of the contents of the cysts; and on the 29th of January he passed a considerable quantity of pus from the bladder, which was followed by a diminution in the swelling. From having measured $42\frac{1}{2}$ inches he diminished to 39 inches. Altogether in twelve hours he passed five pints of purulent urine.

He refused to have anything done to him after this, and left in very good health.

On looking over the cases of diseased kidneys, I think it advisable to avoid details of the various forms of disease which are called (not distinguished) by the name of Bright's disease. At present it must be confessed that there are very many instances where the exact condition of the kidney cannot be made out; and I think this may be partly attributed to the frequently insidious commencement of the disease, and to the very imperfect histories which are given by the individuals. But that condition of renal disease which is known by the name amyloid, is more easy of separation from the other forms of Bright's disease, and the instances that have been detected during the past year have been tabulated in a similar manner to that used in the former Reports. It is unnecessary to give more than the following details.

Of fourteen cases admitted, seven died in the house, and one very shortly after leaving it; the others were relieved.

Of the fatal cases, the following causes seemed to have been the *origo mali*: abscess of leg for a considerable (uncertain) period in one case; in one case for seven months; renal abscess for twelve months; phthisis for terms varying from two months to two years.

Of the other cases, one was probably due to a three-years ulcer and abscess of leg, one to a renal abscess of three years' standing, others to phthisis of various duration. One other case has been recorded at length above.

Four cases of diabetes mellitus were admitted. They were dieted in the usual manner. Of the four patients two died, one from oedema of the glottis, one was sent out in a dying condition, one was dismissed slightly improved. The two patients that died had suffered from symptoms of diabetes for a long time, one for fifteen months, the other

for two years; the others had been ill for shorter periods. It should be remembered that diabetic patients are always intolerant of the diet given them in hospital, and as far as my experience goes seldom adhere to it in spite of the greatest watchfulness on the part of the nurses. Very often some improvement, especially in the decrease of the diabetes, is shown at first, but this is usually transient, and confinement in hospital is then as detrimental to a diabetic patient as to a phthisical patient.

Statement of the number of in-patients under treatment in the Medical Wards of St. George's Hospital during the year 1867.

Remaining in the Hospital, January 1st, 1867, males, 58; females, 61: total, 119.

Admitted during the year, males, 830; females, 812: total, 1642.

Discharged, 1416.

Died, males, 150; females, 77: total, 227.*

Remaining January 1st, 1868, males, 64; females, 56: total, 120.

Average number in the Hospital daily, males, 59; females, 47: total 116.

Mean residence, 26 days.

Rate of mortality, 13·8 per cent: males, 19·6; females, 9·5.

Of other diseases I have no special remarks to make; but the numbers of each will be found by a reference to the annexed table.

* Of this number 31 were brought in dead, or died within twenty-four hours of admission.

TABLE I.

Table of Cases admitted into the Medical Wards of St. George's Hospital during the Year ending December 31st, 1867.

Nature of disease.	Total number admitted.	Total number of deaths.	Percentage of deaths.	Complicated with other diseases.	Deaths among complicated cases.	Observations.
1. Typhus	8	4	50	4	3	One caught in the Hospital.
Typhoid	21	3	14·3	2	2	
Febricula	10					
2. Measles	10	2	50	1	1	
Scarlatina	24			1	1	
Variola	6					
Erysipelas	24	5	20·8	4	3	
3. Intermittents :						
Quotidian	2					The fatal case was one of œdema of the glottis and granular kidneys.
Tertian	2					
Irregular	3	1	33·3	1	1	
4. Rheumatism :						Heart-disease was the complication in all cases: the fatal case was one admitted with pericarditis.
Acute	61	1	1·6	38	1	
Chronic	18			4		
Subacute	49			7		
Rheumatoid arthritis	41			2		
Gonorrhœal	16					
Syphilitic	13			1		
Scarlatinal	2					
5. Gout	45	2	4·4	14	1	
6. Poisoning :						
Opium	1					
Oxalic acid	2					
Sulphuric Acid	1					
Mercury	5	1	20	1	1	
Gas	1					
Alcohol	3					
Copivi	1					
7. Lead-poisoning	13	2	15	2		Cases of hydatids.
Syphilis	33	1	3	1	1	
8. Entozoa	2					

Nature of disease.	Total number admitted.	Total number of deaths.	Percentage of deaths.	Complicated with other diseases.	Deaths among complicated cases.	Observations.
9. Dropsy :						
General dropsy	46	16	34·8	45	16	30 of these were cardiac cases, the rest renal.
Ascites	11	10	99	10	10	
10. Hæmorrhages :						
Epistaxis	2	1	50	2	1	Extensive arterial disease.
Hæmoptysis	9	3	33	9	3	
Hæmatemesis	7					
Intestinal	2					
Pulmonary	2	2	100	2	2	
Hæmaturia	4					
General	1	1	100	1	1	No examination allowed.
11. Purpura	4	2	50	3	2	
12 & 13. Anæmia and debility	25	1	4			
14. Cachexia	12					
15. Scrofula	7	1	14	1	1	
16. Tubercles :						
Phthisis pulmonum	138	44	32	47	27	
Laryngeal phthisis	2					
Brain	6	4	66·6	1	1	
Mesentery	10	3	30	1	1	
17. Morbid growths :						No examination allowed.
Thoracic	7	5	71	3	3	
Scirrhus	7	2	28·5			
Uterine	9	3	33	1	1	
Abdominal	24	11	46	3	1	
Skull	1	1	100			
Spine	2	2	100	2	2	
Fibrous	2					
Uncertain	1	1	100	1	1	
18. Hysteria	51			1		
Mania	10					Six of these were accompanied with aphasia.
19. Chorea	18	2	11	2	1	
20. Delirium tremens	31	4	13	4	4	
22. Brain :						
Encephalitis	4	4	100	1	1	
Meningitis	12	8	66	7	6	
Hydrocephalus	3	2	66	1	1	
Abscess	3	3	100			
Softening	5	4	800	4	4	
Congestion	3	3	100	2	2	
Apoplexy	7	7	100	6	6	
Functional	5			3		
Epilepsy	9			1		
Spinal	5	2	40	1		
23. Paralysis :						
Hemiplegia	28	3	11	5	1	

Nature of disease.	Total number admitted.	Total number of deaths.	Percentage of deaths.	Complicated with other diseases.	Deaths among complicated cases.	Observations.
23. Paralysis— <i>contd.</i>						
Paraplegia . . .	20	4	20	8	2	The fatal case was one of malignant disease of the skull.
Local . . .	6	1	16.6	4	1	
24. Neuralgia :						
Sciatica . . .	14	. .	. .	1		
Lumbago . . .	6	. .	. .	1		
Pleurodynia . . .	3					
General . . .	5					
25. Heart-disease :						
Pericarditis . . .	20	8	40	17	6	
Pericardium adherent . . .	2	2	100	2	2	
Hypertrophy . . .	16	9	36	9	9	
Dilatation . . .	11	6	54	7	4	
Fatty . . .	3	2	66.6	3	2	
Valvular disease . . .	119	43	36	68	33	
26. Disease of vessels :						
Phlebitis . . .	10	2	20	3	1	
Phlegmasia dolens . . .	2					
Embolism . . .	12	12	100	12	12	
Atheroma . . .	13	9	69	8	7	
Aneurysm . . .	13	3	23	1		
Varicose veins . . .	2					
Hæmorrhoids . . .	2					
Gangrene . . .	1	1	100	1	1	
27. Lungs, &c. :						
Bronchitis . . .	51	10	19	23	7	
Emphysema . . .	23	4	. .	6	4	
Pneumonia . . .	75	19	25	24	10	
Pleurisy . . .	34	8	23	7	3	
Pneumothorax . . .	2	2	100	1	1	
Abscess of Lung . . .	3	3	100	1	1	
Empyema . . .	8	2	25	2	2	
Asthma . . .	5	1	20			
Congestion . . .	8	2	25	1		
Whooping Cough . . .	1					
Malignant of lung . . .	3	3	100	1	1	
Fibroid . . .	1	1	100	1	1	
Hæmothorax . . .	1	1	. .	1	1	
28. Mouth and pharynx :						
Stomatitis . . .	1					
Quinsy . . .	18					
Laryngismus stridulus . . .	1					
Laryngitis . . .	1					
Malignant of larynx . . .	1	1				
Diphtheria . . .	3	1	33	1		
Croup . . .	3	2	66.6	1	1	Tracheotomy in 2 cases.
Ulceration . . .	4					
Mumps . . .	4	. .	. .	1		

Nature of disease.	Total number admitted.	Total number of deaths.	Percentage of deaths.	Complicated with other diseases.	Deaths among complicated cases.	Observations.
28. Mouth and pharynx— <i>contd.</i>						
Œdema glottidis .	6	4	66·6	5	4	Laryngotomy in 4 cases.
Spasm of glottis .	1					
Submaxillary abscess . .	1					
Goitre . . .	2	. .	. .	2	. .	Exophthalmia in both cases.
29. Stomach :						
Dyspepsia . .	33					
Malignant . .	6	2	33·3			
Ulcer . . .	5					
Abscess . . .	1	1				
30. Intestines :						
Constipation .	6					
Colic . . .	2	. .	. .	1		
Typhlo-enteritis .	3	. .	. .	1		
Abscess . . .	3	1	33·3			
Ulceration . .	2	1	50			
Diarrhœa . . .	9					
Dysentery . .	1					
Cancer of rectum .	1					
Perforation . .	1	1	. .	1		A case of typhoid perforation.
31. Peritoneum :						
Peritonitis . .	16	11	67	11	11	
32. Liver :						
Cirrhosis . .	22	16	72	16	14	
Enlargement .	2	1	50	1	1	
Congestion . .	1					
Abscess . . .	5	3	60	1	1	
Jaundice . . .	13					
Gall-stones . .	2					
Inflammation .	2					
Lardaceous . .	11	8	72	11	8	
Malignant . .	6	5	83·3	3	2	
34. Spleen :						
Enlarged . . .	2	2	100	2	2	
35. Kidneys :						
Nephritis acute .	41	12	30	9	6	
" chronic .	6	4	66·6	4	4	
Small kidneys .	66	33	50	38	27	
Lardaceous . .	16	9	56	15	9	
Pyelitis . . .	5	1	20	1		
Calculus . . .	3	. .	. .	2		
Malignant . . .	2					
Cystitis . . .	9	2	22			
Gravel . . .	1					
Melasma supra renalis	1					
36. Diabetes :						
Mellitus . . .	4	2	50	1	1	
Insipidus . . .	1	. .	. .	. .	. .	Hysteria.

Nature of disease.	Total number admitted.	Total number of deaths.	Percentage of deaths.	Complicated with other diseases.	Deaths among complicated cases.	Observations.
37. Ovaries :						
Tumours . . .	4	1	25			
Inflammation . . .	2					
Abscess . . .	1	1				
Dropsy . . .	10	1	10	. . .	. . .	Paracentesis in 3 cases.
38. Uterus, &c. . .						
Amenorrhœa . . .	8					
Dysmenorrhœa . . .	10					
Menorrhagia . . .	19					
Leucorrhœa . . .	12					
Inflammation . . .	10	1	10			
Tumours . . .	8	1	12·5	1		
Pelvic abscess . . .	2	1	80			
Pregnancy . . .	3	1	33·3	1		
Ulceration . . .	2					
Retroversion . . .	1					
39. Bones and Joints . . .	14	3	21	4	3	Cases transferred to Surgeons' ward,
40. Skin :						
Squamous . . .	14	1	7	1	1	
Scabies . . .	2					
Erythema . . .	12					
Vesicular . . .	5					
Rupia . . .	1					
41. Muscles . . .	4	1	25			
42. Anomalous . . .	7					

TABLE II.
Table of Cases of Acute Rheumatism.

Month.	Sex.	Age.	First attack.	Previous attacks.	Date of admission.	Days in Hospital.	Amount of joint-inflammation.	State of heart, &c. on admission.	Result.
January.	M.	13	1	..	5	16	Rather severe.	Thumping action. No murmur.	Well.
	M.	19	1	..	8	20	Severe.	Increased action.	Mitral murmur.
	M.	14	1	..	4	18	Rather severe.	Aortic and mitral murmurs.	Aortic and mitral murmur.
	F.	13	1	..	6	14	Rather severe.	Pneumonia. Endocarditis.	Pericarditis in the house.
	F.	25	1	..	8	21	Severe.	Free.	Endocarditis. No murmur.
	F.	15	1	..	5	23	Severe.	Aortic and mitral murmurs.	Murmurs.
	M.	25	..	2	9	63	Severe.	Aortic and mitral disease.	Same.
	F.	19	..	1	8	31	Rather severe.	Mitral.	Mitral.
	M.	29	..	3	7	21	Rather severe.	Old mitral.	Same as on admission.
	M.	?	..	1	6	21	Not severe.	Old aortic and mitral.	Same as on admission.
Feb.	M.	?	..	2	8	42	Not severe.	Endocarditis.	Free from murmur.
	F.	20	..	1	8	14	Not severe.	Old mitral.	Same as on admission.
	M.	40	1	..	13	14	Rather severe.	Free.	Free.
	F.	17	1	..	22	63	Very severe.	Free.	Pericarditis in house.
March.	M.	24	1	..	5	33	Rather severe.	Old mitral.	Increased murmur.
	F.	17	1	..	6	20	Severe.	Endocarditis.	No murmur.
	M.	29	..	1	9	16	Slight.	Natural.	Natural.
	M.	22	..	1	6	35	Very severe.	Endocarditis.	Slight murmur.
April.	M.	32	..	Several	13	28	Severe.	Endocarditis.	No murmur.

Month.	M.	19	1	..	6	21	Slight.	Natural.	Same as on admission.
May.	F.	29	1	..	15	20	Slight.	Slight murmur.	None.
	F.	19	..	2	3	19	Slight.	Old murmur.	
	M.	20	1	..	6	37	Severe.	Pneumonia.	Increased impulse.
June.	M.	27	1	..	18	55	Severe.	Pericarditis.	Mitral murmur.
	M.	30	1	..	14	25	Slight.	Natural.	Natural.
	F.	16	1	..	11	49	Not severe.	Murmur.	Murmur.
	M.	21	..	1	7	28	Severe.	? Anæmia.	Pericarditis.
July.	F.	34	1	..	5	40	Severe.	Endocarditis.	Well.
	F.	23	1	..	15	28	Severe.	Rapid action.	Disease of hip-joint.
	M.	35	..	1	22	21	Severe.	Pericarditis.	Well.
	M.	13	..	1	15	28	Not severe.	Endocarditis and pericarditis.	Well.
	F.	22	..	1	5	23	Slight.	Increased action.	Well.
August.	M.	22	1	..	8	14	Not severe.	Mitral murmur.	Well.
	M.	37	1	..	15	30	Slight.	Endocardial murmur.	Well.
	M.	12	1	..	8	18	Severe.	Systolic mitral murmur.	Murmur.
	F.	17	1	..	7	36	Slight.	Natural.	Well.
	F.	27	1	..	Uncertain.	12	Slight.	Mitral murmur.	Well.
	F.	22	1	..	3	32	Slight.	Action quick.	Aortic and mitral murmurs.
	F.	19	1	..	13	32	Severe.	Mitral murmur.	Less murmur.
	M.	..	..	1	22	50	Slight.	Natural.	Well.
September.	M.	..	..	1	3	50	Severe.	Natural.	Well.
	M.	23	..	1	15	28	Slight.	Pericarditis.	Heart's sound clear.
	M.	24	1	..	11	28	Slight.	Natural.	Well.
	F.	16	1	..	8	49	Severe.	Pericarditis.	Mitral murmur.
September.	F.	22	1	..	8	18	Severe.	Endocardial murmur.	Well.
	F.	26	1	..	7	35	Slight.	Natural.	Well.
	M.	23	..	..	1	..	Slight.	Purpura.	? Mitral murmur.

TABLE II. (*continued*).

Month.	Sex.	Age.	First attack.	Previous attacks.	Date of admission.	Days in Hospital.	Amount of joint-inflammation.	State of heart, &c. on admission.	Result.
December, Nov. October.	F.	29	1	..	7	72	Very severe.	Pericarditis and endocarditis.	? Adhesion. Mitral murmur.
	F.	14	1	..	1	18	Slight.	Natural.	Well.
	M.	20	..	2	3	57	Severe.	Urine very albuminous.	Pericarditis and endocarditis.
	M.	14	..	1	3	12	Not severe.	Endocardial murmur.	Well.
	F.	29	1	..	8	14	Very slight.	Increased action.	Well.
	M.	26	1	..	8	71	Severe.	Natural.	Pericarditis. Well.
	M.	21	1	..	4	34	Not severe.	Natural.	Well.
	M.	22	..	1	8	38	Not severe.	Endocarditis.	Pericarditis. Well.
	F.	31	..	1	3	12	Severe.	Aortic and mitral murmur.	Same as on admission.
	F.	23	..	1	10	32	Not severe.	Natural.	Well.
	M.	..	Uncert.	..	8	..	Very slight.	Pericarditis.	Died.

TABLE III.

Table of Cases of Pneumonia.

Sex.	Age.	Date of disease.	State of lungs on admission.	Treatment.	Days in Hospital.	Result.
M.	29	5 days	$\frac{1}{4}$ right apex solid .	Antimony .	11 days.	R.
M.	22	2 days	$\frac{2}{3}$ right apex .	Cupping and antimony .	19 days.	R.
M.	22	Doubtful	$\frac{1}{2}$ right bare .	Antimony .	20 days.	R.
M.	37	21 days	Both apices .	Ipecacuanha .	19 days.	R.
M.	36	4 days	Both bases .	Nitre .	14 days.	R.
M.	28	14 days	$\frac{3}{4}$ left (upper) solid .	Ipecacuanha .	28 days.	R.
M.	26	1 day	$\frac{1}{4}$ right solid, tubercles	Antimony .	32 days.	R.
M.	14	5 days	$\frac{1}{2}$ left solid .	Antimony .	13 days.	R.
M.	28	4 days	Both apices .	Antimony .	14 days.	R.
M.	17	6 days	Right lung solid .	Antimony .	23 days.	R.
M.	24	5 days	$\frac{1}{2}$ left (lower), first stage	Antimony .	10 days.	R.
M.	13	6 days	Right solid .	Ammonia .	28 days.	R.
M.	41	3 days	$\frac{2}{3}$ upper right solid .	Antimony .	30 days.	R.
M.	25	2 days	$\frac{4}{5}$ lower left .	Antimony .	30 days.	R.
M.	20	5 days	Right solid .	Antimony and brandy .	12 days.	Died.
M.	26	28 days	Left solid, second stage .	Antimony .	37 days.	Died.
F.	43	7 days	$\frac{1}{3}$ right base, solid .	Antimony .	23 days.	Died.
F.	53	3 days	$\frac{1}{3}$ right upper .	Antimony .	23 days.	R.
F.	21	2 days	Right base .	Squills .	12 days.	R.
F.	19	14 days	Left solid, third stage	. . . . .	. . . . .	R.
F.	48	14 days	Left apex .	Antimony .	27 days.	R.
F.	21	6 days	$\frac{2}{3}$ upper right solid .	Salines .	7 days.	R.
F.	Uncertain	5 days	Right lung solid .	Antimony and digitalis for 2 days	12 days.	R.
F.	19	21 days	Right solid .	Wine .	33 days.	Died.

REGINALD THOMPSON, M.D.

Medical Registrar.

REPORT OF SURGICAL CASES

TREATED IN THE HOSPITAL DURING THE YEAR ENDING
DECEMBER 31st, 1867.

In the following Report the same classification has been followed as in those of former years, viz. into, firstly, cases of injury; and, secondly, cases of disease.

These have been subdivided: the first class, namely that of injury, into A. General, and B. Local injuries; B. being again subdivided according to the seat of the injury.

The second class (diseases) has been similarly divided in the first place; but in the further divisions reference is made to the organ affected, and not to the region of the body the disease occupies.

The total number of cases admitted into the surgical wards during the year was 2066: 843 with injuries, and 1223 with diseases. Thirty-one cases were transferred from the medical wards, having been admitted in the first instance with some medical disease; and twenty-four were transferred from the surgical to the medical wards, having been relieved so far as their surgical disease was concerned, or because the medical disease became the more urgent.

GENERAL INJURIES.—Forty-one *burns*, of which 19 died, and 27 *scalds*, of which six died, have been admitted. All the fatal cases died either from the shock to the system consequent on the injury; or if at a more remote period, from exhaustion consequent on sloughing and the drain of so profuse a purulent discharge, none from the secondary mischief set up after such injuries. One woman, while stooping over a fire, set her clothes alight, and was brought in dead, the skin over the whole body being completely charred. Three of the burns were complicated; 1st, a slight burn of the face, with a fractured thigh; 2dly, a woman, who was subject to epilepsy, had a fit and fell into the fire, destroying a portion of the skin on the left side of chest. While in the Hospital she had several epileptic fits; and 3dly, a child, while playing, set her clothes alight, and charred the skin of face and arms. She was subsequently attacked with scarlet-fever, and was transferred to the medical wards: all of these recovered. One scald of the leg was complicated with a fracture of both bones of the forearm; she also recovered. The greater number, as is usual in this class of injury, occurred in children,

who, crawling about, had either pulled vessels of boiling fluid over them, or getting too near the fire, had set their clothes alight. The local treatment almost universally adopted was that of covering the injured parts with some simple cerate and cotton-wool, or with the carron oil, and exposing them as little as possible compatible with the offensiveness of the accumulating discharge. Where much sloughing existed, the compound elemus ointment and poultices were made use of; and in some cases, in the later stages, lotions of carbolic or sulphurous acid, with some apparently good effects. The constitutional treatment consisted in supporting the patients with good diet, and in some of the severer cases stimulants and opiates were made use of. Both the number of cases and also the percentage of mortality is somewhat higher than in either of the two preceding years.

INJURIES OF THE HEAD.—In this class 172 cases were admitted, of which 19 proved fatal; four being brought in dead, and several others dying shortly after their admission.

Seventy-three cases of *simple scalp* wounds are recorded, some of which call for a short notice.

1st. F. F. (256), æt. 25, was thrown out of a cart, and was reported to have been insensible for about ten minutes. On admission there was an irregular wound about three inches long over the left frontal eminence, with considerable bruising of the scalp in the neighbourhood. Portion of the skin sloughed, and seventeen days after admission he was attacked with erysipelas. This died away, but ever after he complained of great pain across forehead, and had a furred tongue. The two days before his death his manner is noted as being strange, and there was vomiting; but these and a comatose condition a few hours before death were the only symptoms recorded. At the examination after death there was extensive suppuration in the substance of the brain and also in the cavity of the arachnoid and at the base.

2d. G. P. (1708), æt. 35. Fell down some stone steps and struck the left side of his head against one of the steps. On admission there was a cut about $4\frac{1}{2}$ inches long over the upper part of left side of the forehead and temple, with a good deal of bruising of the skin. There was some slight sloughing of the edges of the flap of skin, with bagging of pus, which had to be let out by counter-openings, as the greater part of the wound healed by first intention. He was progressing favourably when, on the 16th day after admission, he had two rigors, followed by sweating for three days more. He apparently got well again, and was up and about (the wound being almost healed) till the 25th day after admission, when he had two slight convulsions; but the pulse was perfectly quiet, and he complained of no pain in the head. No symptoms were manifested again till thirty-one days after admission, when he had pain in the head and furred tongue, and was somewhat flushed. Pulse 64 and full. He continued in this state for three days, when he became suddenly comatose, with stertorous breathing, and died a few hours later—thirty-four days after the accident. At the post-mortem examination, the portion of the bone at seat of injury was found necrosed,

and there was a circumscribed abscess in the anterior lobe of left side, about the size of a child's fist, full of foetid pus; the brain around being healthy.

Nine cases were followed by diffuse inflammation of the scalp, one only proving fatal, and that in a boy eleven years old, who, six days before admission, had been struck on the head by a stone. He died on the thirteenth day; but no post-mortem examination was made. In several cases the wounds were closed with lint and collodion, and did remarkably well; and in one extensive wound Lister's carbolic paste was used in the later stage after suppuration had set in, the wound healing without further mischief.

Twenty-two cases were admitted where *the wound exposed a portion of bone*, four proving fatal. One man was brought in dead, with a scalp-wound exposing the bone, and probably rupture of some abdominal viscus; but as no examination of the body was allowed, this could not be verified. In two cases inflammation of the diploë of the skull, commencing at the seat of injury, and followed by pyæmia, occurred, and both patients died. One patient, who had fallen about ten feet across a girder, was admitted with a scalp-wound exposing the bone, and also with rupture of a kidney. He died on the fourth day. Two cases were followed by diffuse cellulitis, and one by tetanus. The last of these cases deserves some notice. F. B. (1935), æt. 40, was pitched off the box while driving a brougham. On admission there was a jagged wound over the left temple the size of the palm of the hand, exposing the bone for about one inch. Four days after admission, the wound being in a sloughy state, deglutition became somewhat difficult, and there was inability to open the mouth above a quarter of an inch. During the next fortnight the symptoms increased, but very gradually, and at the end of this time there was some rigidity about the muscles of neck and abdomen; the jaw was slightly more closed, and the risus sardonicus became apparent. He was ordered turpentine internally in drachm-doses every four hours, and suppositories of extract of conium in five grains three times a day. The symptoms gradually passed away and he was discharged, after being in the Hospital two months, with slight stiffness in muscles of the neck, and some remains of the risus sardonicus. The wound was almost healed.

Forty-seven cases of *concussion* are recorded, varying in degree from slight stupor to complete unconsciousness for some days; none proved fatal, though several on leaving the Hospital were somewhat dull and heavy.

Simple fractures of the skull furnish us with ten examples, eight proving fatal. In three which were brought in dead the men had fallen from considerable heights, and had the bones of the skull smashed and depressed. Three more cases were admitted with other injuries; one with fractured ribs, one with dislocation of the humerus, and one with a scalp-wound independent of the fracture; in all the injury was extensive, and they died shortly after admission. In two other cases there were symptoms of injury to the brain. Both died almost immediately after admission. Three cases of *compound fracture with depression*

were admitted. In one there was injury to the brain, with considerable smashing and depression of the bone; all the depressed bone was removed with forceps and the elevator, without the use of the trephine. The patient died. In the two other cases the fractures were over the frontal region, and the depression slight. Both recovered without further mischief. Eleven cases of *fractured base* occurred, five of which died shortly after admission. In several of those that recovered there was well-marked paralysis of one side of the face, which in some had almost disappeared before they left the Hospital; in some few nothing more than continuous bleeding from the ear led to the diagnosis. Five cases of *contusion* of the scalp, all of which did well, concludes our list of injuries to the head.

INJURIES OF THE FACE.—Thirty-five cases in this class were admitted, none proving fatal. Seven cases of *fracture of the lower jaw* (one being complicated with fractured ribs), and one of *dislocation of the lower jaw*, were admitted, all of which made good recoveries. Three *wounds of the eyeball* occurred; in one case the sight of the eye was lost; and three *wounds of the cornea*, where some opacity still existed, though it was diminishing when the patients were discharged. One man, who had been attending as an out-patient, had the upper eyelid cut through with a piece of glass; no union had taken place, so he was admitted into the Hospital, and underwent a plastic operation, which resulted in a perfect cure. The other cases in this class consisted chiefly of *bruises* and *slight wounds*, acquired in drunken rows, and require no particular notice. One man, who had thrown up a tin-kettle to shoot at, had his face covered with small shot-wounds, which were caused by the shot glancing off the kettle; the eyes were uninjured, and he was discharged well in the course of a few days.

INJURIES OF THE BACK furnish us with thirty-eight cases, two of which proved fatal, both being *fractured spines* (the only two cases of this injury admitted). One man, who had fallen off a traveller, was brought in moribund with the limbs all paralysed, and the breathing diaphragmatic; the chest-walls were also smashed, and he died six hours after admission. The other man, with fractured spine, fell downstairs while drunk the evening before admission, and was taken home and put to bed; when seen the next day his arms and legs were found to be completely paralysed and devoid of sensation. He lingered on for a week, the lungs becoming more and more choked up every day, but was quite conscious to the last. The post-mortem examination revealed a portion of the body of the fourth cervical vertebra fractured and pressing on the cord. Two cases of slight *concussion* of the spinal cord occurred, both making good recoveries after a week or two of rest in the recumbent position. The rest of this class consisted of *sprains* or *contusions*, and recovered without further treatment than rest and ordinary lotion.

INJURIES OF THE NECK.—Under this head fourteen cases are recorded; eight of suicidal *cut-throat*, two of which were fatal and brought

in dead; one where the right carotid artery was cut across, and the other one of the large veins; five of *contusions* and *sprains* of the neck, and one with a *wound of the tongue*. Of the six cases of cut-throat that recovered, the thyro-hyoid membrane was divided in two, and the upper part of the trachea in one; the rest were superficial, not extending into the air-passages. In one case delirium tremens set in, but under the ordinary treatment in this Hospital, of opium and stimulants, he recovered. A boy, fifteen years old, was struck on the jaw while his tongue was protruding, and inflicted a small wound with his teeth. The other cases present no features of interest.

INJURIES OF THE CHEST.—Under this head the total number of cases admitted was thirty-seven; six proved fatal, one of them being brought in dead with smashing-in of the chest-walls, and bleeding from the mouth and nose, having had a heavy stone fall on him. The greater number in this class were *fractures* of one or more *ribs*, twenty-seven being admitted with this injury. Four cases were admitted with other injuries also, viz: two with *fracture of the skull*, both proving fatal; one with *dislocation of the humerus* and some internal injury, who died shortly after admission, but as no post-mortem examination was made, it was impossible in so short a time to diagnose the organ injured; and one with *fracture of the lower jaw*, which recovered. Four cases were followed by *bronchitis*, two proving fatal; one other was further complicated with a fracture of the clavicle, but as this occurred in a healthy boy, he recovered. In the other cases in which bronchitis supervened, the patients were all over fifty years of age, and subject to cough in the winter, so that it was rather an aggravation of a mischief already existing, than a fresh disease set up by the fractured ribs. Nine cases were admitted with *contusions of the side*; one a man aged 57, had fallen a height of twenty feet on to his right side, and had been attending as out-patient for three days; no fracture of the ribs could be made out, but bronchitis supervening, he was admitted into the Hospital, and made a good recovery.

INJURIES OF THE ABDOMEN furnish us with seventeen examples, some of which present peculiar interest. A young man, aged 21, who was reported to have been always very healthy and strong, while skating on the Serpentine fell, and was supposed to have struck himself in the belly with a post that was projecting about a foot above the level of the ice; he was picked up quite insensible, and when brought to the Hospital was quite dead. There were no marks of external injury, and though a post-mortem examination was made, no light was thrown on the cause of death, all the organs being perfectly healthy, except that there was a very slight atheromatous condition of the arteries of the brain, though this had evidently nothing to do with his death. Another case was that of a woman, aged 30, who crossing the street fell, and the fore-wheel of a heavy wagon passed over her abdomen. On admission she was in a state of profound collapse; but some hours later rallied somewhat, and blood was found oozing from the vagina; a catheter was passed into the bladder, and about half an ounce of almost

pure blood was drawn off. The next day she rallied, and complained of great pain across the lower part of the abdomen; her expression was very anxious, and her pulse fluttering. During the day the pain continued; she was repeatedly sick, and in the evening aborted of twins; vomiting, with swelling of, and great tenderness in, the abdomen existed for about five days; the urine, at first loaded with blood, became clearer. These symptoms gradually subsided, and about three weeks after admission an abscess formed in the left side, just below the false ribs. This burst, and with it almost all pain ceased. It continued discharging pretty freely for about four weeks, and then healed. After this the patient gained strength, no further mischief set in, and she was discharged at the end of eleven weeks. Both the cases, presenting many features of interest, leave us in doubt as to the real nature of the injuries received. Two cases were admitted where boys climbing over railings had inflicted *lacerated wounds of the scrotum*. In one case both, and in the other only the left testicle was hanging out of the wound, which, after being cleansed, was returned, and the wound closed; suppuration was set up in the scrotum to a slight extent, but both made good recoveries. One case was admitted with *laceration of the labia*, caused by falling on the chamber-pot, but did well. There was one case of *superficial wounding of the abdomen* by the discharge of a pistol, but no mischief was set up, and the wound healed. In three cases, one of which was brought in dead, *rupture of some abdominal viscus* probably occurred, though as no examinations were made, this could not be proved. One case lived four days; and from there being continually blood in the urine, there was no doubt that the kidney was the organ injured. Two cases were admitted with *rupture of the bladder*, one being jammed between a large piece of timber and the wall, and the other being struck by the buffer of an engine; the former lingered four days, the latter died the same day. One boy, aged 14, fell from a scaffold about twenty feet high on to his right hip, and was admitted with a *fracture through the right ilium*, just below the crest. There was great tenderness, with distinct crepitus; he made a perfect recovery. The rest in this class consist of *contusions*, none of which were severe, and all recovered.

INJURIES OF THE UPPER EXTREMITY have been divided, for the sake of convenience, into *contusions*, *wounds*, *fractures*, *dislocations*, and *sprains*; the total number admitted being sixty-five, of which six proved fatal. Nine cases of *contusion* of the upper extremity are noted, five being street-accidents. None were of a severe nature, and all did well. The *wounds* of the upper extremity furnish us with seventeen examples, the bulk of which were caused by the patients cleaning windows, slipping, and their hand passing through the glass. In six cases there was very considerable hæmorrhage, and it was on this account that the patients were admitted; one of the arteries of the forearm being wounded in three cases, the superficialis volæ in two, and the palmar arch in one. The hæmorrhage was arrested by ligaturing the artery in four cases, and by a compress of lint in the other two. Seven cases were admitted

with wounds caused by the hand or arm being caught in some machinery; one wound of the hand being complicated with a fracture of the forearm, and one with a scalp-wound and general bruising. In the case that was complicated with a fracture of the forearm, the wound in the hand was treated after Lister's plan with the carbolic paste, and though the wound did ultimately well, it did not prevent suppuration taking place.

The total number of *fractures* in this class admitted was thirty-one, ten being compound, which will be considered separately. Five fractures of the clavicle occurred, one of which died of bronchitis. This was a man aged 80, who fell down-stairs; he had been subject to cough. On admission there was a fracture of the left clavicle, with considerable general bruising; loud râles could be heard all over left side of chest. He died ten days after admission. Another man, aged 32, missed his hold of a ladder, and fell some 20 feet. On admission, there was fracture of the left clavicle, and also fracture of the upper third of the left thigh; he made a good recovery, and was discharged at the end of six weeks. The other cases of fractured clavicle were uncomplicated, and all recovered.

Five *fractures* of the humerus were admitted, four occurring in persons between the ages of 67 and 82, from slipping down in the street. One was through the neck of the bone, the others through the shaft. The other case was a woman, aged 53, who was knocked down by a horse in the Park, and who on admission was also somewhat bruised about. All five cases recovered.

The number of *fractures* of the forearm admitted was nine, the greater number of such fractures, as also of the other fractures of the upper extremity, being treated as out-patients. A woman, aged 65, was thrown down during a row, and struck the back of her hand against some broken earthenware. On admission, there was a Colles' fracture of the left forearm, and a superficial wound about three inches long across the back of wrist. She was discharged after eleven days' stay in the Hospital, with the wound nearly healed, and the arm in good position. A boy, aged 10, who was riding on the shafts of a wagon, fell over, and his left arm doubled-in under him; his left foot being also squeezed between the wheel and the kerb. He was admitted with a fracture of the left radius, and a wound about three inches long on the upper surface of the left foot; there was also considerable swelling of the whole of the left foot. When discharged, seven weeks later, the union of arm was firm, and the wound of foot healing. The other cases demand no particular notice, and all recovered. Two cases were admitted with a fracture through the lower part of the scapula, both having had severe blows over that region. In one case the crepitus was very distinct.

Of *compound fractures* ten were admitted; six were of the arm or forearm, and four of the hand. Of the first six I propose making no mention now, as they will be found, together with similar fractures of the lower extremity, in a table in a later part of the Report. All the four latter were caused by the fingers being caught in some machinery, and required amputation of some portion of the hand. In one case it was necessary to remove all four fingers, together with the heads of the

metacarpal bones; and it was astonishing to see what the man (a very intelligent one) could do with the thumb and remnant of the hand. In two, the middle-finger and the little-finger respectively, together with the heads of the metacarpal bones; and in the other, only the second and third phalanges of the middle- and ring-finger. All did remarkably well.

There were six *dislocations* of the upper extremity in the Hospital last year; four of the humerus, one of the elbow, and one compound dislocation of the thumb. The first dislocation occurred in a man aged 31, who was subject to fits, and who some years previously, while in a fit, fell and dislocated the right shoulder, which had never been reduced. He was in the Hospital during the latter part of last year, when reduction was attempted, but without success. On the evening of his admission he had a fit, fell, and dislocated the left humerus into the axilla. This was reduced, and, considering his helpless state, he was taken into the Hospital. The second was subclavicular, and had been done about a month when he was admitted; it was reduced under chloroform. The third was into the axilla, and was reduced without difficulty. The patient had other severe injuries, and died about two hours after admission. The fourth occurred in an old woman who regularly went the round of all the hospitals, giving different accounts. The dislocation was evidently very old, and could not be reduced. One case of dislocation of both bones of the forearm backwards occurred in a man aged 39, who the day before admission, while driving a van, ran against a post, and was thrown out. On admission, there was so much swelling that it could not be diagnosed; but a few days later it was reduced under chloroform, and the patient did well. The last case was one of compound dislocation of metacarpo-phalangeal joint of right thumb in a man aged 30, who was thrown off a cab. It was reduced; but delirium tremens set in, and he died on the fourth day.

Two cases of *sprain* of the wrist complete our list of injuries to the upper extremity.

INJURIES OF THE LOWER EXTREMITY, like those of the upper, have been divided into *contusions*, *wounds*, *fractures*, *dislocations*, and *sprains*; the total number being 402, of which fourteen died. Seventy-eight cases of *bruising* of the lower extremity were admitted of all degrees of severity, one only proving fatal in an old man who fell from a loft on to some paving-stones, a distance of about 15 feet. On admission, there was an extensive extravasation of blood in the upper part of right thigh; suppuration set in, and the man died of exhaustion about six weeks after admission. The other cases of contusions call for no particular notice.

Sixteen *wounds* of the thigh, twenty of the leg, and twelve of the foot, were admitted; one of the leg and one of the foot proving fatal. One man was brought in dead, having been struck by machinery in the upper part of left thigh. There had been a large amount of bleeding, and the femoral artery was found ruptured. Another man, while engaged in excavating, had a large mass of earth fall on to him, driving

the handle of the pickaxe with which he was working through the upper part of the left thigh, and fixing him to the ground. The handle was taken out of the thigh before admission, and brought up to the Hospital with him. It was about twenty inches long and about five or six inches in circumference at either end. On admission, there was a jagged wound on front of left thigh about four inches below Poupart's ligament, and a corresponding opening on the posterior aspect of the thigh a little lower down. There was no hæmorrhage, though the stick must have passed close to the femoral artery. There was slight sloughing of the edges of the wound, and suppuration in the track of the stick; but the patient made a good recovery. A boy was run over by a cart, and was admitted with extensive laceration of the thigh; considerable sloughing took place, but he recovered.

Of the twenty wounds of the legs, one was followed by phagedæna in a boy aged 15, who had been run over, and was admitted with a lacerated and very contused wound over the inner side of left leg. Considerable sloughing ensued, but the patient ultimately got well. Three other cases were followed by inflammation of the absorbents and erysipelas. One man, aged 25, was admitted with a lacerated wound about three inches long on the outer side of the left ankle. Neither the ankle-joint nor any bone was injured. The wound was dressed after Lister's plan with carbolic-acid paste; but though the wound did well, and healed perhaps in a shorter time than it would have done with the ordinary water-dressing, suppuration was not prevented.

Twelve cases were admitted in which the wound was seated in the foot, one only of which calls for particular notice. A young man, aged 18, got his foot squeezed in the table of a railway. On admission, there was a jagged wound about two inches long on the inner side of the right ankle, the soft tissues over the foot being much contused. The wound was dressed after Lister's plan, with the carbolic-acid paste, four hours after the accident. Extensive suppuration, with considerable constitutional disturbance, set in, and the dressing was removed on the seventh day, when a great portion of the skin in the neighbourhood was found in a sloughing state, and an abscess found burrowing up the leg, which was laid freely open. By the twenty-first day, hectic symptoms had set in, and the sloughing somewhat extended, so it was thought advisable to remove the foot, which was done by amputation in the middle of the leg. Pyæmia followed, and he died fourteen days after the amputation. The other cases were not of a severe nature, and all did well.

One hundred and eighty-nine cases of simple *fractures* of the lower extremity occurred, six of these proving fatal. Of these fractures, forty-six were of the *shaft of the femur*, one only proving fatal in an old man accustomed to drink, who fell off the top of a wall, and was admitted with a fracture of the right thigh extending into the knee-joint, who was a good deal shaken about. He became very excitable on the third day, and after this gradually sank and died. Three cases were complicated with other injuries. One, a young woman, who was knocked down while crossing the road by a dustcart, was admitted, with a fracture of the middle of the right femur, and a lacerated wound of the left leg.

She was discharged at the end of three and a half months with strong union, and the wound quite healed. A man, aged 39, was admitted with a fracture of the middle of the left thigh, and a superficial wound, not communicating with the fracture, over the lower third of the thigh. The wound healed without suppuration, having been closed with lint and collodion, and the man was discharged at the end of the forty-fifth day with fairly firm union. The third case was complicated with a slight burn of the face, and has already been alluded to.

Of the remaining cases, one occurred in an idiot, and was of the lower third. He would not have any splints on, and though they were put on, he soon had them off again; so he was simply kept quiet in bed. At the end of five weeks there was fairly firm union with great thickening at the seat of fracture, and but about three-quarters of an inch shortening. Another, in a man aged fifty-three, accustomed to drink, who, when discharged at the end of four months with pasteboard splints on, had scarcely any union. The rest all did well, and were discharged with pasteboard splints on at the end of about a month to six weeks, some few boys at a somewhat earlier date. The treatment almost universally adopted was the long outside splint with a foot-piece, and short splints round the thigh, with a perineal band to keep up the proper length. In one case, where the fracture was through the condyles, the limb was swung after the plan adopted at St. Bartholomew's Hospital, and did well; there being about a quarter of an inch shortening when he was discharged at the end of fifty-three days. Four cases of *fracture of the neck of the femur* close our list of fractures of this bone, one of which, occurring in a very old man, proved fatal.

Seven cases of *fracture of the tibia* alone, and forty-eight cases of *fracture of the fibula* alone, were admitted. One of the latter was complicated with general bruising.

Fifteen cases of *fracture of the patella* occurred. In one man who slipped downstairs and tried to recover himself, both patellæ were fractured, and he did remarkably well. All except one were transverse, and the result of muscular action. In most cases Malgaigne's hooks were employed with very good result; but in the other cases, which were simply raised on a single incline, the results were almost as good.

Simple fractures of both bones of the leg furnish us with sixty-seven examples; a few only of interest will be noticed. The first of these occurred in a man, aged 33, who slipped off the kerb, and was admitted with an oblique fracture of both bones of right leg. About three weeks after admission he suddenly became very faint and blanched, dying a few minutes after. On examining the body, he was found to have a very fatty heart. Another man, aged 48, fell from a height, and was admitted with a fracture of both bones of left leg just below the knee, and a large extravasation of blood. Abscess appeared to have formed by the twentieth day, and a grooved needle was passed into the swelling, but only a little pus and a jet of blood spurted out. Hæmorrhage from the wound occurred the day after the puncture, and again the next day, and as the patient was very exsanguine and weak, the opening was enlarged, and the anterior tibial artery found torn across. This was tied,

but the patient died a few hours later. A man, aged 36, fell off a ladder and broke his right leg three days before admission. He was seen by a medical man, who put the leg up in splints. On admission, there was a fracture of both bones of the right leg in its lower third. The leg was done up in splints, and bandaged so tightly, that the toes were quite cold, and the leg much discoloured, cold, and covered with blebs. Sloughing of the skin and a large abscess at the seat of fracture ensued, and it was deemed advisable to remove the limb, which was done by amputation of the thigh in its lower third. Tetanus set in on the fifth day, and he died the next evening. Further notice of this case will be taken under the head "Tetanus."

Seventeen cases of *compound fracture* occurred, nine being of the long bones, the rest of some part of the foot. Those of the long bones will be found in the table of compound fractures, and need not be considered here. A few of those of the foot deserve some short remarks. In three cases, one of the toes was so smashed that it was necessary to remove the toe at once; and in a man, aged 47, in whom the big-toe was removed, sloughing of the skin ensued and pyæmia on the eighth day; he died on the fifteenth day, with secondary deposits in the lungs. In another case, in which a toe had been removed, the man had an acute attack of pneumonia, when the wound was nearly healed; he eventually recovered. One patient, who was at work on a plank, slipped and fell a distance of about seven feet on to his right foot. On admission, there was a clean-cut wound, dividing a vessel which had been tied, about two and a half inches long on the inner side of the right foot, just below the internal malleolus, and on passing the finger in, the os calcis could be felt smashed up. Several pieces of bone were removed, and the leg placed on an outside splint. Sloughing set in, and burrowing of matter up the leg; so it was deemed expedient to remove the foot, which was done by a circular amputation in the middle of the leg. Portion of the skin sloughed, and the bone protruded through the skin; but the patient ultimately recovered, and was discharged with the stump nearly healed at the end of two and a half months.

One *dislocation* only occurred in the lower extremity, and that in the hip of a woman, aged 30, who fell downstairs and hurt her left hip. On admission there were the ordinary signs of dislocation on to the pubes, except that the movement of the limb was scarcely deteriorated in any respect; the head of the bone could, however, be distinctly felt in its new position. The dislocation was reduced under chloroform with the pulleys.

Sixty-six *sprains* of the lower extremity are recorded, none of which present any features of interest.

One case of *gunshot wound* occurred in a man, aged 30, who, while out shooting with some friends, had a discharge of shot lodged in his calves from a distance of about twelve paces. On admission there were numerous shot-holes in both calves, with considerable bruising and swelling. On the third day gangrene set in, and spread rapidly; so the leg was removed, though the patient was moribund, as it gave

him the only chance of his life; but he died directly after the operation. On examining the limb, no artery of consequence was wounded, nor was there much extravasation of blood. One case, a man, aged 41, sprained his left knee about four weeks before admission, and about two weeks later noticed a swelling at the inner side of the left thigh just above the knee. He continued to get about for three days; but after that was obliged to keep his bed, on account of pain and the increasing size of the tumour. On admission, there was a diffused tumour about the size of the double fist, firm, not fluctuating or expanding, but slightly elevated with each beat of the artery. It was hot and tender at the most prominent part, and gave him so much throbbing pain that he was unable to sleep at all at night. The next day a grooved needle was put in, and a jet of arterial blood spurted out. A tourniquet was put on the femoral artery, but not completely stopping the circulation. As the swelling increased in size, the femoral artery was tied with silver wire in its upper third. The swelling decreased slightly at first; but eleven days after the application of the ligature there was oozing of blood from the wound. The next day there was more hæmorrhage from the wound, and as the tumour was increasing in size, and the man very exsanguine, amputation of the thigh at the point where the artery had been tied was performed; but the patient sank, and died early the next morning. On examining the limb, a large clot of blood was found to compose the tumour, and a laceration was found in the artery about three quarters of an inch long, just as it entered Hunter's canal.

A case of fracture of the remains of a femur finishes our list of injuries. The patient, who had had the thigh amputated in its lower third about forty years before, fell and fractured the stump of the femur about two inches above the end.

GENERAL DISEASES.—Under this head are included: 1st, *Erysipelas*; 2dly, *Diffuse Cellulitis*; 3dly, *Sloughing*; 4thly, *Senile Gangrene*; 5thly, *Tetanus*; 6thly, *Pyæmia*; 7thly, *Gout*; and lastly, *Traumatic Gangrene*. Taking the first disease on our list, viz. *erysipelas*, we find the total number of cases treated was thirty-two, two only of which proved fatal.

In eighteen cases the erysipelas attacked wounds either after operations or otherwise, but in the rest was idiopathic. In both the fatal cases it was idiopathic, and broke out while the patients were in the Hospital suffering with other diseases.

The first fatal case occurred in a man aged 50, who was admitted with old-standing stricture of the urethra. Three weeks after he had been in the Hospital, erysipelas of a very acute nature attacked the face, and he sank seven days later.

The other fatal case happened in a policeman, aged 28, admitted with laryngeal phthisis, and similar mischief in the lungs. When he had been in the Hospital twenty-four days he was attacked with erysipelas of the face, which spread rapidly, and proved fatal on the fourth day.

One woman, aged 70, who had been operated on for strangulated femoral hernia, had erysipelas set in at the seat of the operation on the fifth day. This faded away, but the patient died a few days later of ulceration of the gut, and can therefore hardly be reckoned as a fatal case of erysipelas. The treatment varied according to the state and age of the patient: in the young and robust, where the disease supervened on wounds, an aperient, with salines and low diet, often sufficed to arrest the mischief; while in the less healthy the muriated tincture of iron, with stimulants, seemed highly beneficial.

Diffuse cellulitis furnishes us with nineteen examples, five only of which terminated fatally.

A man, aged 72, was brought to the Hospital in a very exhausted condition, with diffused cellulitis of the foot. He was delirious when admitted, and sank six days later.

A young man, aged 18, was admitted with diffuse cellulitis of the left leg. Free incisions were made, and for a time the case promised well, but the mischief subsequently spread up the thigh, and abscess formed in the knee-joint. Extensive sloughing ensued; the patient became hectic, and sank.

In two cases the disease set in after scalp-wounds; and though numerous incisions were made, the patients died of pyæmia.

The other fatal case occurred in a man, aged 36, who was admitted with a simple fracture of the left leg, three days after the accident. When admitted the leg was so tightly bandaged that the skin was much discoloured and covered with blebs. Diffuse cellulitis set in, and a considerable portion of the skin sloughed, necessitating amputation of the thigh. The patient was attacked with tetanus after the amputation, and died. (See also under head "Tetanus.")

The other cases were treated with free incisions and good nourishment, and recovered.

Twelve cases are entered as *sloughing*. They all recovered, and call for no particular notice.

Two cases of *senile gangrene* occurred: one in an old man, aged 70, where the disease was limited to the little-toe, who recovered; and the other in a woman, aged 58, where the mischief began on the big-toe, spread over the foot, and was extending up the leg, when the patient sank of exhaustion.

Tetanus set-in in four cases, two of these proving fatal. In one of the fatal cases the disease existed on admission into the Hospital.

The first case was that of a man, aged 40, who was admitted drunk on January 13th, having been thrown off his cab. On admission there was a compound fracture of the right humerus, extending into the elbow-joint. The limb was put up on an inside angular splint, and went on well till the 28th, when the patient complained of stiffness about the jaws, and great starting of the arm; pulse 84, wound healthy. (Ordered enema tereb. h. n.) He was but little relieved by the injection, and by February 3d, the tetanic symptoms having gradually increased, he had some difficulty in swallowing. The jaws were firmly closed; slight vertigo, and great starting of the arm. A solution of

$\frac{1}{40}$ grain of atropine and $\frac{1}{4}$ grain of morphia was subcutaneously injected, and seemed to afford some relief. On the 4th the symptoms continued the same, and he complained of pain in the epigastrium. The injection was repeated three times during the day, and the amount of atropine and morphia increased to $\frac{1}{30}$ and $\frac{1}{3}$ respectively. On the 5th there was slight risus sardonicus, the other symptoms continuing the same; so the injections were repeated, the patient appearing relieved slightly for about two hours after the injection. After this the symptoms very gradually began to pass away, the injections being used at first four times a day, but subsequently less frequently. At the end of a fortnight the trismus was almost gone, the tongue could be fully protruded, and the risus sardonicus could scarcely be distinguished. He was discharged March 13th, with the wound almost healed, and with very fair movement in the joint.

The second case occurred in a boy, aged 12. The account given was that he fell about ten feet a fortnight before, but appeared perfectly well till the evening before admission, when he became convulsed, and got rapidly worse. On admission, February 25th, 4.50 P.M., opisthotonos was very severe, the body being supported on the head and heels during the spasms, which were almost continuous; muscles of the neck rigid; risus strongly marked; face livid; jaws firmly locked; pupils dilated and fixed; pulse 160, and small; respiration 44. He was subcutaneously injected with $\frac{1}{80}$ grain of atropine and $\frac{1}{8}$ grain of morphia, and fell asleep for about a quarter of an hour; after which the spasms returned as severe as before, and the patient died early the following morning.

The third case occurred in a man, aged 40, who was admitted with a jagged wound, exposing the bone over the left temple; but as this case has been given somewhat fully under injuries to the head, no further notice seems necessary. The patient perfectly recovered.

The fourth case was in a man, aged 36, whose thigh was amputated for fracture, complicated with diffused cellulitis.

On December 28th the thigh was removed by a long anterior flap-amputation. The bleeding vessels were secured by acupressure needles; and the sciatic nerve being included with the femoral vessels in the loop of silver wire, the edges of the flaps were brought into apposition with hare-lip pins and figure-of-8 silk ligatures.

January 1st, 1868, progressed favourably. Several of the acupressure needles removed to-day, and a little oozing of serum followed; pulse 130; free from pain.

On January 2d the rest of the acupressure needles removed, and a good deal of bloody fluid oozed out, with some pus. Two of the hare-lip pins removed; pulse 120; tongue somewhat dry. He fancied he had caught cold, as he had pain at the outer sides of the upper jaw, and was unable to open his mouth more than a quarter of an inch, which inability increased towards the evening.

On January 3d the jaws were quite closed, the head thrown back, and the muscles of the neck quite rigid; the whole body more or less rigid; spasms moderately severe, and almost continuous; pulse

weak, 120. The rest of the hare-lip needles were removed, and the stump found full of dark grumous fluid. The spasms became very severe towards night, and he died during one of them. He was treated with suppositories of five grains of extract of conium every four hours, but apparently without relief. At the post-mortem examination the spinal cord was found congested, and somewhat softened in the dorsal region.

Pyæmia. Twenty-three examples of this disease occurred during the past year, one only of which recovered. Of this number ten occurred after operations: one after amputation of the thigh; two after amputation of the leg; two after amputation of the arm; one after amputation of part of the foot; two after removal of dead bone; one after removal of polypus of the rectum, and one after plastic operation on the penis, death occurring in all the foregoing cases. After death, in all the cases that were examined, secondary deposits were found. In the remaining cases that proved fatal, child-birth was the origin of the disease in two instances, the patients being admitted with secondary abscesses, and dying after the mischief had run a very chronic course. Diseased bone, and inflammation of the diploë of the skull after scalp-wound, gave origin to the disease in the rest. The only case that recovered occurred after gonorrhœa, and deserves some notice.

The man, aged 35, was admitted December 25th, 1867, with effusion into the left knee, accompanied with great pain. The history given was that he contracted gonorrhœa six weeks before admission. Two weeks later he had pain and swelling in his shoulders and knees. This subsided in the shoulders and right knee, but persisted in the left. Seven days before admission the discharge from the penis subsided, and the following day he had a severe rigor, followed by sweating. The rigors and sweating were repeated about six times. On admission there was considerable *synovitis* of left knee, with great pain in moving it. Pulse 112; tongue moist and coated. He complains of catching pain when he takes a deep breath. For eight days he had severe rigors about once a day, followed by profuse sweating, tightness of chest, with cough, and slight mucous expectoration. Pulse varying from 112 to 130; expression anxious; tongue dry, and at times brown; pain and fulness about left shoulder. He had no rigors after this, but the sweating continued, though less severe, for about five days longer, when it ceased, the cough diminished, and the pain about the shoulder and knee passed away; his pulse gradually went down, and his condition improved. At the end of seven weeks he left the Hospital, weak, but all the acute symptoms had passed away. The treatment consisted in the administration of full doses of quinine, with the sulphate of iron and extract of conium, together with generous diet, when the patient was able to take it, and stimulants.

One case of *gout* occurred in a man, aged 57, who was admitted with ulceration of the leg, and who was transferred to the physician's wards.

The only remaining case in this class was one of *traumatic gangrene*, of which the following are short notes. A man, aged 30, was out shooting with some friends, when one of the guns went off, the

contents (small shot) being lodged in his legs, from a distance of about twelve paces. On admission there were numerous shot-holes at the back of both knees, extending from the middle of the thighs to the middle of the calves, especially numerous at the back of the left knee. The left lower limb was immensely swollen and discoloured, and the tibial arteries could not be felt on account of the swelling. On the following day the patient was somewhat blanched; pulse 108; legs in the same state. Towards evening he appeared to faint away, and for a time was pulseless. The leg and foot became cold, and gangrene commenced in the calf. As a last chance the limb was removed by an amputation of the thigh, but the patient sank, and died shortly afterwards. On examining the limb after its removal, there was commencing gangrene in the calf, though no artery of any size was found ruptured, nor was there any amount of blood extravasated into the cellular tissue.

DISEASES OF THE ORGANS OF MOTION.—As this forms a class about a third in number of the total diseases, it is most conveniently divided into: 1st, Diseases affecting bone; 2dly, Diseases affecting joints; 3dly, those affecting the bursæ; and lastly, those affecting the muscles, tendons, &c.

Considering in the first place those diseases affecting the *bones*, we find that the total number admitted was 149, of which seven only proved fatal. Two cases occurred in which there was a *circumscribed abscess* found in the bone; the first occurred in an old soldier who had been severely wounded in the battle of Alma by the bursting of a shell. For some months he had suffered great pain in the lower part of the tibia, where some rough bone could be felt. A trephine was applied, and some soft bone removed, exposing a cavity containing pus in the lower end of the tibia, which extended almost down to the ankle-joint. After this cavity had been freely laid open, it filled up, and the patient recovered, but not till after there had been considerable sloughing of the skin in the neighbourhood. The second was in a young man, aged 24, who for eight years had had constant pain in the head of the left tibia; he had been trephined about a year before admission, and the pain instantly ceased. When admitted there was a cavity in the head of the left tibia about the size of a cob-nut; but as nothing more was to be done, and the Hospital being very full, he only remained under treatment a few days.

Fifty-nine cases of *necrosis* were admitted, three being of the skull, three of the lower jaw, two of the bones of the forearm, one of the ilium, one of the sacrum, eight of the femur, six of the bones of the hand or foot, two of the stump after amputation of some years' standing, and the remaining thirty-three of the tibia. Twenty cases were submitted to operation, five being followed by erysipelas. The case in which necrosis of the sacrum occurred was in a man aged 52, who for some years had suffered from apparently sciatica, and six months before admission slipped down on to his right hip. Ten days afterwards a swelling appeared over the right ilium, matter formed, and an abscess

was opened, which continued to discharge from a sinus, the bottom of which could not be reached, for about four months. The patient became pale, and his urine albuminous, the purulent discharge continuing very free. The sinus was then laid open, but the patient sank a few days later. At the post-mortem examination a small piece of necrosed bone, about the size of a horse-bean, was found lying loose in a cavity in the anterior part of the sacrum; an abscess connected with this, and also an opening into the sacro-iliac joint, was discovered, which passed out of the pelvis, through the sacro-sciatic notch, and discharged itself on the outer side of the right ilium. The kidneys were found to be amyloid, as was also the liver. A man, aged 50, who had contracted syphilis sixteen years before, and was completely saturated with the syphilitic virus, was admitted with necrosis of the skull, and also of the lower jaw. A portion of the necrosed jaw was removed, and the patient's health appeared to have somewhat improved, when he fainted suddenly, and died at once. The kidneys after death were found slightly granular, but there were no other lesions to account for death. The third and only other fatal case occurred in a man, aged 32, who had necrosis of the tibia after fever. Some dead bone was removed with the aid of the trephine; but fourteen days after the operation, the wound being sloughy and discharging unhealthily pus, he was attacked with rigors, followed by profuse sweatings. These were frequently repeated, and he died five days later.

A boy, aged 11, of strumous aspect, was kicked on the lower part of the left leg nine months before his admission, at which time there was thickening of the lower part of the bone, and a sinus leading down to a necrosed portion. The sinus was laid open, and a small piece of necrosed bone was removed. Phagedæna followed and burrowing of matter, which subsequently found its way into the ankle-joint, thus necessitating amputation. The limb was removed (see operation table), and the patient recovered. In two other cases of necrosis of the tibia, both of syphilitic origin, phagedæna set in, and considerably increased the extent of necrosed bone. The rest of the cases of necrosis call for no particular remarks, the greater number occurring in children of scrofulous tendency, in many the disease being very extensive. One boy had the entire shaft of the tibia removed at two separate operations. Twenty-eight cases of *caries* were admitted, three of which proved fatal. This number consisted of one case of caries of the rib, one of the sternum, four of the pelvic bones, six of the femur, three of the tibia, and thirteen of the bones of the hand or foot. The total number of operations was eight, two of which were followed by pyæmia and proved fatal, the rest did well. One other case, in which no operation was performed, also died of pyæmia. A woman, aged 35, was admitted, who four years before had sprained her right foot; six months later it began to swell, and abscesses formed and burst, and were discharging on her admission, when on passing a probe into the wound, the astragalus could be felt quite soft. There was also fluid in the ankle-joint, with starting, and great pain at night. The foot was removed (see table of operations); and though there was some secondary hæmorrhage, the patient re-

covered. In one little boy, aged 5, there was extensive mischief of the os calcis; but as it was confined to this bone, the whole bone was excised (see operation-table) with very good results. A boy, aged 14, in whom there were incipient signs of phthisis, sprained his right wrist six months before admission. Abscesses formed and burst, and when admitted there were numerous sinuses leading down to soft bone in the neighbourhood of the wrist. Nearly the whole of the carpal bones were removed in small pieces; but as the patient's health appeared to be suffering, he was sent into the country with the wounds unhealed, and some diseased bone still unremoved. In the other operations, various portions of bone were gouged away; one case, after operation, was attacked with erysipelas, which soon passed away, and all did well.

Twenty-six cases of *disease of the spine* were admitted, fourteen being complicated with abscess either in the psoas muscle, and presenting itself in the upper part of the thigh, or in the loin. In one case the disease was situated in the lower cervical vertebræ: in seven in the lumbar, and in the rest in some portion of the dorsal vertebræ. One case only proved fatal, and that was a girl, aged 16, who was admitted with abscesses in both groins connected with the spine, through the sheath of the psoas. She was in a very weak state, with incipient phthisis and albuminous urine, and died of exhaustion about a month after she was admitted. One woman, aged 26, was admitted with curvature in the lower dorsal region, and abscesses both in the loin and also in the upper part of the thigh. One other case of dorsal curvature was accompanied by disease of the hip-joint; but the patient was discharged improved in health. In two cases where curvature existed in the middle dorsal region, there was also some paralysis of the lower extremities. *Lateral curvature* occurred in seven cases, none proving fatal, the patients being discharged with proper instruments.

Tumours of bone furnish us with five different cases, three of which were submitted to operation. One case was readmitted, not wishing at first to have any operation performed. The first case was a boy, aged 16, who was admitted with an exostosis on the inner side of the femur, about two inches above the condyle. It was congenital, and had given him no trouble till the last three months, since which time it increased somewhat and became very painful. It was the size of a hen's egg, and was removed under chloroform without difficulty, the wound healing without a bad symptom. The second was an exostosis, and occurred in a boy aged 12, and was situated at the upper and inner side of the humerus. It was of four months' standing, and about the size of a large walnut; but as it caused him little inconvenience, and considering its proximity to the joint and the large vessels, it was deemed inexpedient to interfere. The third case was a myeloid tumour of the upper jaw, in a woman aged 27. It was first noticed eighteen months before its removal, and was increasing rapidly in size, filling up the roof of the mouth; and projecting over the alveolar ridge, gave a very prominent appearance to the cheek. It necessitated removal of the greater part of the upper jaw (see table of operations); but the patient made a good recovery, and was discharged at the end of twenty-

two days. About eight months after the operation the patient was seen, but the seat of operation was perfectly healthy. This patient was admitted twice; and this explains how, that, although there were but five different cases, six appear under this head. The fourth case was one of malignant disease of the head of the tibia, of four months' duration. It was in a man, aged 24, and was rapidly increasing in size; but as he was unwilling to submit to any operation he left the Hospital. The last case occurred in a man, aged 49, and was one of malignant disease of the upper jaw. He first noticed a swelling on the left cheek four months before its removal; and as it was gradually increasing in size, it was determined to remove the whole jaw. This was done (see table of operations); but the bone being completely destroyed in places, had to be picked away piecemeal, though at length the whole of the diseased tissue was apparently removed. The upper lip of that side sloughed; but the patient ultimately recovered, and was sent down to the country a month after the operation, with no reappearance of the disease. In the beginning of the present year the patient returned from the country, and was admitted with a return of the disease at the inner angle of orbit.

One case of *rickets* was admitted, but presented no features of interest.

Twenty cases of *periostitis* occurred, and all recovered. In only two cases did the mischief run on to suppuration, and in both it was the result of injury. The other cases were all chronic in their nature, and the bulk of them of strumous origin; in four cases, however, it could be distinctly traced to syphilis. In three-fourths of the cases the tibia was the bone affected. The treatment found most efficacious was that of cod-liver oil with the syrup of the iodide of iron, or in those of syphilitic origin that could bear it, iodide of potassium internally and the calomel vapour-baths. In the two cases where suppuration occurred, a free incision down to this bone gave almost instantaneous relief.

The total number of cases of *synovitis* admitted was ninety-three, none of which terminated fatally. Of this number thirty were the result of recent sprains and other injuries, and affected the knee-joint in by far the majority. Perfect rest and the application of warm lotions, and in some cases where there was much pain, the application of a few leeches, soon restored the joint to its normal condition.

Sixteen cases are entered as *ulceration of the cartilages*, which in many cases were also accompanied with some effusion into the joint. These all improved with rest, blistering, the occasional administration of calomel and opium where the nocturnal pains were severe, or the application of Scott's bandage. One case was the result of gonorrhœa; and in one woman, aged 38, there was probably some malignant disease, there being malignant disease of the kidney; but the patient was transferred to the physicians, and left the Hospital shortly after incurable.

Eighteen cases of *abscess in joints* are recorded; fourteen being submitted to operation, and two terminating fatally. Six of the cases occurred in the upper extremity, viz. one in the claviculo-scapular

articulation, one in the shoulder-joint, one in the elbow, and one in the wrist; the other two occurring in the hand. The first of these six occurred in a girl, aged 18, and was apparently the result of pyæmia. The sinus was still discharging when she left the Hospital. The second in a woman, aged 45, resulted in ankylosis. The third in a strumous boy, aged 15, necessitated excision of the joint (see table of operations), ending in a good recovery. The fourth case, which was the result of diffuse inflammation of the hand and forearm and subsequently suppuration in the wrist, called for amputation (see operation-table), but ultimately the patient, who was in a very weak state, recovered. The others were the result of neglected thecal abscesses. Twelve cases occurred in the lower extremity, of which the knee was the seat of mischief in ten cases, and the ankle in the other two. Of the former, four underwent amputation of the thigh, one only proving fatal, and that in a case where the patient was in an extremely exhausted condition when admitted; and six excision of the knee-joint, one terminating fatally on the twentieth day of pyæmia. In both cases in which the mischief was in the ankle-joint, amputation of the leg was performed, and both recovered. A more detailed account of these cases will be found in the table of operations.

One case was admitted where there was *relaxation of the ligaments*.

Nineteen other cases occurred in which the joints were the seat of mischief: four being *hysterical*, two *rheumatic*, ten in which *ankylosis* had taken place, and where the patients were admitted in order to put the joint at a better angle, and three of *loose cartilage*. In one only of the cases of loose cartilage could the piece be caught, and then a ring of gutta-percha was fastened on the knee enclosing the cartilage, in the hopes of fixing it permanently in that situation by setting up some local inflammation.

Disease of the hip furnishes us with thirty-three examples; one only was submitted to excision. In sixteen of the cases the disease was in its early stage; and by the recumbent position for some weeks, and in some cases for months, till the pain had subsided, with the application of the long thigh-splint (the limb having been straightened under the influence of chloroform), or by extension made by a weight to the foot, the patients were able to get about with a leather hip-splint.

Eight cases were admitted where abscess had formed, and by rest were considerably relieved. In the others the mischief was of longer standing, and considerable absorption of the head of the bone had taken place. A brief account of the case in which excision was performed may prove interesting. The patient, a girl, aged 14, had had a limp in her walk for about four years, but during the last three months the pain had been very severe, and on admission the least movement gave her considerable pain. She was kept in the recumbent position with a long thigh-splint on, and the limb extended. About ten weeks later, the pain continuing and the patient's health becoming somewhat impaired, the limb was examined, and crepitus detected in the joint. The joint was excised (see table of operations), and the pain ceased, nor did it ever recur. About six weeks after the operation a small piece of

bone came away, the patient being quite free from pain, and her health much improved. At the end of nine weeks she was allowed to get up, and get about on crutches, the wound healing slowly. Five months after the operation she was sent to Margate, the wound being nearly healed. There was two inches shortening, and she was able to bear a great portion of her weight on that leg, though she could not get about without crutches.

The number of *inflamed bursa* admitted was thirty-six, all with one exception being over the knee. Fourteen went on to suppuration, and in three cases there was burrowing of matter about the knee, which necessitated counter-openings. Two were submitted to operation; the rest subsiding under the treatment of Goulard lotion and blistering, and the application of iodine when all inflammatory symptoms had passed over. The first case that was submitted to operation occurred in a woman, aged 29, who had enlargement of the right bursa patella for eleven years. When admitted there was a solid mass about half-an-inch thick over the right knee. This was dissected out, and on being cut through was found to consist of a very firm gelatinous substance enclosed in a very thick capsule. The other occurred in an old cavalry soldier, and was situated over the sacrum. It was removed; and this patient, as well as the former, made a good recovery.

Two cases of *ganglion*, situated on the front of the forearm and extending beneath the annular ligament into the palm of the hand, were tapped, and numerous little millet-seed-like bodies evacuated, suppuration being set up in one case. Two ganglia in the ham, and two synovial cysts, one connected with the wrist and one with the knee-joint, were also admitted.

Nine cases of *theat abscess*, one of which necessitated amputation, and ten cases of *contracted tendons*, most of which were treated by the subcutaneous division of the tendons, together with a case of *muscular atrophy*, which was transferred to the medical wards, complete our list of diseases of the organs of motion.

DISEASES OF THE ORGANS OF CIRCULATION.—Fifty-seven cases are entered under this head: three being disease of the *heart*, twenty-seven of the *blood-vessels*, and the rest of the *lymphatics and glands*. Two cases in which the heart was diseased terminated fatally. One, a man, aged 45, was brought in dead, with sundry bruises, having fallen down in the street. On examining the body extensive disease of the mitral valve was found. The other, a man, aged 33, was admitted with a simple fracture of both bones of the right leg. He was convalescent, and going to be discharged the next day, but he suddenly dropped down dead while getting about on his crutches. A post-mortem examination revealed a fatty condition of the heart. The third case was a man who was admitted with bruising of the kidney, and in whom a large thoracic aneurysm was found; he was therefore transferred to the medical wards.

Three cases were admitted with *aneurysm* of the extremities, all occurring in the popliteal space, but one only recovering. The first case was in a man, aged 46, who had noticed a pulsating tumour in

the right ham for six months, which had increased very considerably during the last fortnight. On admission a tourniquet was placed on the femoral artery so as to partially stop the circulation, and under this treatment the aneurysm decreased and became somewhat solid; but as the skin began to give way beneath the pad, the pressure had to be left off, and the tumour increased again. The tourniquet was again applied for a few days over the pubes, but as the patient, who was also subject to bronchitis, and in whom bedsores were forming, was getting weaker, it was determined that the femoral artery should be ligatured. This was done in its upper part with a loop of silver wire; but on the morning of the tenth day hæmorrhage occurred, which was stopped by pressure with a pad of lint. In the evening of the same day hæmorrhage again set in, and it was determined to tie the vessel again a little higher up. This was done about three-quarters of an inch above the seat of the former ligature with another loop of silver wire; but the patient died of exhaustion the next day. At the post-mortem examination the vessels were found extremely atheromatous, and the femoral artery at the seat of the first ligature cut through in almost its entire calibre.

The second case occurred in a man, aged 35, who slipped when getting up on to a horse three weeks before admission. One week later he noticed a pulsating swelling in the right ham, which had been very painful, and was getting much larger the last eight days. On admission there was an aneurysm the size of a large fist in the right popliteal space. Very gentle pressure, both digital and also by means of a tourniquet, was applied for a few hours at a time. This pressure was continued on and off for rather more than a month, at the end of which time there was a good deal of solidity about the tumour. The limb was now slightly flexed, and intermittent pressure kept up as well. At the end of eight days the pulsation had entirely ceased, and the treatment was discontinued. No pulsation recurred; and three weeks after its cessation the patient was discharged, able to get about well with the aid of a stick, the knee being slightly flexed.

The last case occurred in a man, aged 26, who never remembered to have hurt himself; but two months ago noticed a swelling coming in the left ham. For the ten days previous to his admission it increased very considerably, and became very painful. On admission the limb was flexed sufficiently to almost entirely stop the circulation, and was kept in this state for a week. On unflexing the limb there did not appear to be any pulsation, but the knee was hot and swollen, and the skin at the back inflamed from the flexion. Slight pulsation returned the next day, but the patient could not bear the limb to be flexed. The swelling subsequently increased in size, though a great part of it was solid, and abscess threatened at the back part. A month after the limb was unflexed, the skin at the back of swelling gave way, and some bloody serum escaped. This serum continued to ooze out at times for a week, and then a distinct jet of blood spurted out; so it was deemed expedient to amputate the thigh at once, as the patient was beginning to look pale and weak. This was done (see table of operations); but the patient died of pyæmia at the end of eighteen days. On examining the limb, the swelling was found to consist of coagulated blood, and the

artery lay at the bottom completely divided, with an interval of about three inches between the two ends.

Two cases of *navus* are recorded. One of the tongue, which was cured by the subcutaneous ligature; the other of the arm, which was dissected-out, and an attempt made to save the skin over it, which did not, however, prove quite successful, though the patient made a good recovery.

Sixteen cases of *varicose veins*, and two of *phlebitis*, one of the latter following the ligature and subcutaneous division of a vein, were admitted. In nine cases of varicose veins, one or more of the veins were ligatured and subcutaneously divided, and all recovered.

Secondary hæmorrhage occurred in three cases: once in a case of compound fracture, once after ligature of the femoral artery with silver wire, and once after amputation of the leg. The two former cases proved fatal.

Five cases of *inflamed absorbents*, and twenty-one cases of *suppurating glands*, one of which proved fatal, are recorded. In the fatal case the glands were situated in the neck and of a cancerous nature, the patient having twice had a cancer of the lip removed. They were injected with acetic acid, and suppuration set up; hæmorrhage also occurred, and the patient sank. The remaining case in this class was one of *hypertrophy of the glands* in the axilla of twenty years' standing, occurring in a man, aged 51. They had increased considerably during the last five months, and became inconvenient. They were dissected-out, and consisted simply of gland-tissue, the patient being discharged at the end of three weeks with the wound almost healed.

DISEASES OF THE ORGANS OF RESPIRATION furnish us with eighteen examples; in six cases the disease being situated in the larynx, in the other twelve in the lungs. In two cases the laryngeal mischief was due to syphilitic thickening and inflammation. One patient died of oedema of the glottis before he had been in the Hospital many hours. The other was submitted to tracheotomy, and recovered. Tracheotomy was performed in one other case, under the physician's care, suffering from aphonia and dyspnoea, which had existed for three months. He was relieved by the operation; but when the tube was being changed about one month after the operation, he became asphyxiated, and was dead before it could be reintroduced. At the post-mortem examination an encephaloid tumour about the size of a large pea was found attached to the left vocal cord, besides cancerous deposits elsewhere.

Two cases of *laryngeal phthisis* and one of *chronic laryngitis* complete our number of laryngeal diseases.

Of the diseases of the lungs, five cases were of *bronchitis*, all following fractured ribs; and one occurring in an old man proved fatal.

Six cases of *phthisis* were admitted, four being complicated with other diseases; namely, one with secondary syphilis, one with strumous ulceration of the rectum, one with erysipelas, and one with strumous disease of the knee-joint. Three out of the six cases terminated fatally.

The last case under this head was one of acute *pneumonia*, occurring

in a boy who had been picked out of the water, and who was supposed to have struck his head. He was insensible on admission, and died the next day.

DISEASES OF THE NERVOUS SYSTEM.—This class comprises twenty-five cases in all, four proving fatal. One case only of *epilepsy* is recorded, and that was complicated with a burn. One of *inflammation of the membranes*, occurring after an injury to the head, which subsided under the use of calomel and opium. Two of *delirium tremens*, both consequent on some trivial injury, were admitted; one terminating fatally on the third day.

One case of *syphilitic inflammation of the brain* rapidly improved under large doses of the iodide of potassium; and one case of *circumscribed abscess* of the brain following a simple scalp-wound, died of pyæmia. This last case will be found detailed under "Injuries of the Head."

Hysteria furnished us the greater number of cases in this class, and simulated all manner of diseases, principally those of joints or spinal diseases. *Sciatica* furnished three cases; and the rest were made up of cases of *paralysis*, three of which were infantile, and the others partial and dependent on absorption of the bodies of the vertebræ, thus causing pressure on the cord.

DISEASES OF THE SKIN AND ITS APPENDAGES.—The first class of cases under this head are eruptions, *eczema*, comprising almost half the total number. Twenty-six cases of *eczema* were admitted, one proving fatal in a man, aged 67, who had also granular degeneration of the kidneys. In five cases the *eczema* was acute, and was in most of them situated on the arms and legs. In one case it was situated on the breasts, and one child was covered from head to foot. The treatment that seemed most beneficial consisted of small doses of calomel and James's powder, with saline aperients, an unstimulating diet, and bathing the parts affected with weak gruel. In the majority of cases, however, the *eczema* was of a more chronic nature, almost invariably situated on the legs, and often complicated with old ulceration. In such cases confinement to bed with the leg well raised, and an occasional purgative, proved very efficient.

Three cases are entered as *impetigo*, and all recovered with good diet, tonics, and the occasional use of the warm-bath. In all three the lower extremity was the seat of the eruption, the arms being also covered in one.

Twelve cases of *rupia* were admitted, and in almost all a specific history could be obtained. In two cases the patients were in an extremely emaciated condition, and almost entirely covered with rupial sores. In all the cases rapid improvement, both locally and constitutionally, was observed by the administration of iodide of potassium; and the sores seemed to be much benefited by the local application of calomel vapour.

Seven cases of *psoriasis* and three of *lepra* came under notice. In one case the hands were the parts affected, one of the hands being covered on its palmar surface with thick scabs, and the dorsum of the

nails bevelled-up into a ridge almost half-an-inch in height. In the other cases the legs, and in one the arms as well, were the seat of the eruption. The drug from which most benefit was derived was the bichloride of mercury in small doses; but this required to be administered for some time before any appreciable improvement was noticeable. The remaining cases of skin-diseases were made up of two cases of *lupus*, both of a specific nature, two of *scabies*, one of *purpura*, one of *ecthyma*, and one of *erythema*.

One hundred and twelve cases are entered under the denomination of *ulceration*; one case only, which was followed by senile gangrene, terminating fatally. The species of ulceration consisted of every variety; in five phagedæna existed on admission. In numerous cases the ulceration was accompanied by a varicose condition of the veins, which, when the veins were obliterated by subcutaneous division and ligature, rapidly healed. Several cases had a syphilitic history, and rapidly healed under the local treatment of calomel vapour, and iodide of potassium administered internally.

Sixty-eight cases are entered as *superficial abscess*, of which number only one died. The fatal case occurred in a half-starved child, two years old, who was admitted covered with abscesses and with a patch of unhealthy ulceration over the lower part of the belly. She died a few days after admission.

Five cases of *cancerous ulceration* were admitted, three being submitted to operation, and two proving fatal. The first case of operation was a man, aged 43, who, when a child, had his right hand severely burnt; a few months before admission the cicatrix became the seat of epithelioma. The arm was removed by a circular amputation (see table of operations); but the patient died a month later of pyæmia. Another case was that of a woman, aged 40, who had had ulceration of the right leg for twenty years. Four months before admission a fungous mass appeared on the outer side of the ulcer, and rapidly increased. The thigh was amputated (see table of operations); but the patient, who had also diseased kidneys, died a few days later, secondary hæmorrhage having occurred. A man was admitted with an epithelial ulceration over the left shoulder, which was removed, and the patient recovered.

Tumours connected with the skin and cellular tissues furnished us with twenty-six examples, none terminating fatally. Of this number eight were *fatty* tumour, seven of which were removed; the other occurred in a consumptive girl, and it was thought inadvisable to operate. Thirteen were *sebaceous*, eleven being removed, in one of which erysipelas followed.

Three cases of *cystic* tumours occurred: one in the groin, which was tapped, and subsequently had a seton put through it, which resulted in a cure. (This cure, however, was only temporary. The patient was seen some months afterwards with a large mass of cancer in the region of the groin.) Another in the neck of a patient, who had been frequently in the Hospital before, and on whom every conceivable mode of treatment had been adopted. The cyst was almost completely obliterated. The third was a small cyst, situated over the styloid process of the ulna,

in a man who was in the habit of wearing a strap round his wrist. The cyst was dissected-out, and the patient was discharged cured.

The two remaining cases of tumours were of a *malignant nature*. The first occurred in a woman aged 37, and was situated on the right side of the face, just in front of the ear. It had been removed a short time before. The tumour was dissected-out, and the patient recovered. The second was a large mass, situated over the left shoulder and upper part of the arm. It was of eight months' duration; but as the patient was suffering from phthisis, its removal was not attempted.

One case of *elephantiasis* occurred in the leg of a man aged 40, and which was covered with numerous ulcers. Phagedæna set in, and made considerable havoc; but was arrested by the use of opium and stimulants. The patient was unwilling to remain in, and was therefore discharged.

The rest of this class, none of which present any points of interest, are made up of four cases of *carbuncle*, one of *boils*, eight of *œdema*, one of *ulceration of a stump*, one of *contracted cicatrix* after a severe burn, and one of *inflamed corn*.

DISEASES OF THE EYE, NOSE, AND MOUTH.—Twenty cases of *conjunctivitis* occurred, in five of which it was of a purulent nature, and in two of them could be clearly traced to gonorrhœa, though in the rest this could not be clearly proved. In two of the cases the sight of one eye was completely lost, and in two others the patients were only just able to discern light from darkness.

In the seventeen cases that are entered as *corneitis*, seven were ulcerations with more or less opacity, and many of them of some standing.

Ten cases of *iritis* were admitted; in four it was due to syphilis, in two it was of a rheumatic character, and in the remaining four it was due to injury. In one case in which an injury was the cause, there was also considerable extravasation of blood on the retina.

Two cases of *sclerotitis* occurred, and one of *choroiditis*. In the two former the patients were discharged much benefited; but in the latter, which was of some months' standing, the patient made but little improvement.

Eleven cases of *cataract* were admitted, in three extraction was performed, and in one solution, with very good results. Two cases occurred in which there had been an operation for congenital cataract, but a portion of the capsule had been left behind. In one, a portion of the opaque capsule was removed, and the sight improved.

Three cases of *strabismus* were operated on, and did well. And in one case of *entropion*, a portion of the skin was removed from the upper lid with benefit.

Two cases occurred where the eye was completely destroyed, and was becoming a source of irritation. In the first case, a man, aged 41, the whole eyeball was removed; and in the second, a little girl, aged 11, the fore-part only of the ball was removed, the object being to leave a pad for the better adaptation of an artificial eye.

The other cases consisted of one of *dislocation of the lens*, the

result of a blow, and where the lens could be seen floating about quite separated from its attachments; two cases of *granular lids*, one of *abscess of the lachrymal sac*, and one of *abscess* situated at the back of the orbit.

Two cases of *polypus nasi* occurred, in one of which the tumour hung down into the upper part of the pharynx, and was removed with the *écraseur* introduced through the mouth. It was of the mucous variety; but contained also a considerable amount of fibrous tissue. In the other it was removed with forceps in the usual way, through the nose; both recovered.

DISEASES OF THE ORGANS OF DIGESTION.—This class includes diseases of all the various organs through which the food passes. Taking first those affecting the mouth, we find three cases entered as *abscess of the mouth*, in all a decayed condition of the teeth was the root of the mischief, and when these were removed, the patients recovered. Two cases occurred in which *ulceration of the mucous membrane* took place, and though it was of a sloughy and rapidly-extending nature, as the patients were seen early it was checked before serious mischief set in: both the cases occurred in children. Five cases of *fissured palate* are recorded; but as one case was admitted twice, the patient at the first time of admission being out of health, we are furnished with only four separate cases, all of which were submitted to operation. In one girl, aged 16, the operation which was attempted, in order to close the cleft in the soft palate, completely failed, no union taking place. In a man, aged 24, where there was a cleft through only a small portion of the hard and the whole of the soft palate, the soft palate was united, and the patient discharged with an artificial plate occluding the hole in the hard palate, which was but small, and which would, in all probability, considerably contract. The third case was in a boy, aged 16, in whom there was a cleft through almost the whole of the hard palate and through the soft. The cleft in the soft was united, and in the early part of the present year the cleft in the hard palate was also successfully closed. The fourth case was also in a boy, aged 13; and here also a great part of the soft palate united. In this last case chloroform was administered, and Mr. Thomas Smith's gag employed to keep the mouth open. The operation, from the boy not being completely under the influence of chloroform, and consequently somewhat restless, was somewhat prolonged, and the parts somewhat bruised; and therefore, in a boy of this age, it would scarcely seem that much advantage was derived from its employment.

Hare-lip furnishes us with three examples. In the first case, the child was not then in a sufficiently good state of health to admit of an operation, so she was discharged for a time. The second case was a child who had been operated on before she was admitted; but when the needles were withdrawn, there was a little hæmorrhage, and she was taken in for two days, and the case proved successful. The third child had a cleft of the left side, and was operated on; but as the mother was attacked with rheumatism, she was unable to feed the child, and the operation failed. One case was admitted with *enlarged tonsils*, and

portions were successfully removed. Two cases of *epithelioma of the tongue* occurred. In the first case the disease was of limited extent, and occupied the fore part and right side of the tongue. The disease was removed with the knife, and the patient made a good recovery. In the second case, a man, aged 58, the disease was very extensive, and necessitated the removal of the whole of the tongue, which was done in the following manner: the two incisor teeth having been extracted, an incision was made through the median line of the lower lip and neck to within an inch of the hyoid bone. The lower jaw was then sawn through at the symphysis, the tongue drawn forward, and the *écraseur* applied at its root about one inch above the epiglottis. There was a little hæmorrhage after its removal, which was easily arrested with the common silk ligature. The edges of the lip were brought into apposition with hare-lip pins and healed by first intention. The patient was supported for a few days by nutrient enemata; but soon was able to swallow very well, and was discharged at the end of about six weeks with the wound almost healed, quite able to make himself understood, and well able to take his food.

Six cases are recorded of *epithelioma of the lip*, of which five were submitted to operation. In one case, where a previous operation had been performed, the disease returned, and it was found necessary to remove the greater part of the lower lip, after which, no return of the disease had occurred, when the patient was admitted a few months later with the view of making an artificial lip. In the other cases, the disease was removed either by taking a slice off the lip, or by removing a wedge-shaped piece. Two cases were attacked with erysipelas, which prevented the healing of the wound by first intention; but notwithstanding, the wounds granulated, and the patients made good recoveries.

The total number of cases of *hernia* admitted was forty-three, twenty-six being *strangulated*, thirteen *reducible*, and four *irreducible*. Of the strangulated cases four were returned by taxis under chloroform, after ice had been applied; twenty-two were submitted to operation, of which eight died (see table of operations). Of the rest, thirteen were returned, and the patients supplied with trusses; and four were unable to be returned, and the patients discharged with suspensory apparatus. In one case of reducible hernia the patient, while in the house, was attacked with idiopathic erysipelas of the face; but recovered. One patient, who had had an ovarian tumour removed in the Hospital about three years previously, was admitted with a ventral hernia at the cicatrix of the operation; but this was returned, and the patient discharged with a pad and abdominal belt.

Two cases of *ulcer of the rectum*, twenty-six cases of *fistula in ano*, the sinus being laid open in fifteen, and eighteen cases of *piles*, eight of which were treated by the ligature, were admitted. Ten cases occurred of *stricture* of the rectum. In five of these the stricture was due to malignant growth, and they were discharged incurable; in the other five much benefit was derived from the gradual introduction of bougies smeared with the blue ointment.

Three cases of *prolapsus ani*, all in children, were admitted. In one

case the prolapsus was very extensive; but by the application of nitric acid the child finally was discharged cured.

One child, aged $5\frac{1}{2}$ months, was admitted with a *congenital imperforate anus*, the bowel emptying into the bladder. On examining the boy, it was thought that the rectum was entirely deficient, and that the only remedy was to perform Littre's or Amussat's operation; but as the mother would not consent to this, the child was discharged. The case of a man, aged 37, who was admitted with the symptoms of *intussusception*, deserves recording. He was in the habit of drinking, and eight days before admission, while straining at the closet, he noticed something protrude from the rectum, with great pain and bleeding; he returned the mass, but the pain continued. For the two days before admission, he had great pain in the belly, with repeated sickness, and a constant discharge of bloody matter from the rectum. On admission, his expression was very anxious, he complained of great pain in the belly, and there was a semi-purulent discharge from the rectum. On introducing the finger into the rectum a fold of mucous membrane invaginated into the rectum could be felt. The day after, the patient being in the same semi-collapsed state, an attempt was made to push up the invaginated portion, but without success. For three weeks the patient continued in much the same state, having passed a small piece of intestine in a slough per rectum. A mass was now felt in the rectum close inside the anus, which was secured by a piece of twine and a bougie. The same day this patient had a severe rigor and sweating. Under chloroform, the finger was introduced, and the mass was found to have a distinct and very narrow pedicle; it was pulled down as low as possible, and a ligature of stout cord tied tightly round the pedicle, and the mass removed. The bowels acted after the removal of the mass, and the patient rallied somewhat for two days. On the third day he became collapsed, cold, and almost pulseless. He again rallied slightly; the bowels acted naturally; but he had a fresh rigor, followed by sweating, became unconscious, and died of pyæmia ten days after the removal of the mass.

Two cases of *malignant disease*, one of the pharynx, and one of the œsophagus, were discharged incurable, and one case of *ranula*, which was tapped and a seton passed through, terminate our cases of diseases of the organs of digestion.

DISEASES OF THE URINARY ORGANS.—The total number of cases admitted under this head was ninety-one, six out of this number proving fatal. Four cases are entered as *irritable bladder*, which improved under rest, the occasional use of the warm bath, and tonics. One case of *cystitis* occurred in a man, aged 39, who was of a very unhealthy appearance, and who had also incipient phthisis. He improved under cod-liver oil and the syrup of the iodide of iron.

Fourteen cases of *retention of urine* occurred; in one it was due to the presence of calculus in the back part of the urethra; the patient being subsequently submitted to lithotomy. The other cases occurred in patients who had some slight organic thickening in the urethra, and who by intemperance had brought on the retention of urine for which

they were admitted. By the use of the warm bath, and opium freely administered, these symptoms were relieved.

Calculus furnishes eight examples and three operations; one case in which no operation was performed, died of pyelitis, and at the post-mortem examination a calculus was found in the kidney. In the other cases no stone was detected, though from the symptoms, a strong suspicion of one still existed. One case occurred where the patient refused to remain in the Hospital; and one where the patient, after having left the Hospital some months, brought up a small stone which he passed through his urethra. In the three cases that were submitted to operation, lithotomy was performed, and all recovered, though in one a recto-urethral fistula was established, which was subsequently submitted to a plastic operation, but without success.

A man who, seven months before admission, had a chancre near the frenum, which ulcerated through into the urethra, was admitted with a fistulous opening on the lower surface of the urethra, about the size of the meatus urinarius, through which the urine escaped. The opening was attempted to be closed by a plastic operation; but extensive sloughing ensued, and pyæmia set in, the patient dying with secondary abscesses thirteen days after the operation.

Forty-five cases of *stricture* of the urethra were admitted, nine being complicated with fistulous openings in the perinæum. In three cases where no instrument could be passed, perineal section was performed, and the bladder tapped per rectum in one other case; all making good recoveries. In a man, aged 50, who was admitted with a very old stricture and perineal abscess, pyæmia set in, and he died on the tenth day. One other man also died of pyelitis, who was admitted with a very old and firm stricture. The other cases all recovered, and the strictures much improved by gradually dilating them with catheters.

Eight cases of enlarged prostate occurred, two of which proved fatal. In the fatal cases the patients were aged 67 and 77 respectively, and were in a very exhausted and hectic state when admitted. The other cases recovered, and were discharged, after having been taught to pass catheters for themselves. A young man, aged 20, who had been operated on for stone about four months previously, was admitted twice into the Hospital during the last year with a fistulous opening between the rectum and the urethra. At the first admission, a plastic operation was performed with a view of closing the orifice, which was about the size of a pea, and situated about half an inch from the orifice of the anus. Though after the operation a large-sized silver catheter was tied in the bladder, the urine began to escape per rectum on the fifth day; and on examining the wound about a fortnight after the operation, it was as large as ever. When admitted the second time, after having been at Walton for a month, it was thought unadvisable to perform any further operation, so he was discharged for a time.

DISEASES OF THE MALE ORGANS OF GENERATION.—Seventy-three cases in all were admitted under this head, twenty-five of which were of a *syphilitic* nature, including primary sores, both indurated and sloughing, eruptions, and ulcerations. Two cases of *gonorrhœa* simply,

and five of *buboes* following gonorrhœa, together with two cases of *warts* on the penis, were also admitted. Eleven cases of *phimosis*, in nine of which circumcision was performed, one being complicated with buboes, and two of *paraphimosis*, were admitted, all of which recovered.

Nine cases of *hydrocele*, one of *hæmatocele*, and ten of *orchitis* (two being acute, two scrofulous, and six chronic), occurred, but call for no particular notice. Three cases of *varicocele* (in one the radical cure being performed), and one case of a small *hydrocele of the cord*, were admitted. Two cases of *epithelioma* are recorded; one of the penis in an old man who was not in a fit state for operation, the other of the scrotum in a man aged 62. In this case the disease implicated the greater part of the scrotum; but as no enlarged glands existed, the mass was removed, and the patient recovered, there being only just enough skin left to cover the testes.

DISEASES OF THE FEMALE ORGANS OF GENERATION.—The first set of diseases under this head are those affecting the *female breast*, of which we have twenty-seven examples. Two cases are entered as *inflamed* breasts, and ten as *abscess*, of which five were the so-called “milk abscess.” All recovered, though in some the recovery was delayed by the burrowing of matter, necessitating counter-openings.

Tumours affecting the female breast furnished us with seventeen examples, four being of a *chronic mammary*, eleven of a *scirrhus*, and two of a *sero-cystic* character. None of the first class were submitted to operation; but of the second the breast was removed in five cases, in one only, however, did it prove fatal (see table of operations), and that where points of potassa fusa were introduced, the patient dying of pyæmia. In both cases of the third class the breast was removed with success.

Two cases of *abscess* of the labium, one of *gonorrhœa*, and three of *condylomata* (two of which were submitted to operation), were admitted, and all recovered.

Fourteen patients were admitted with *syphilis*; but in two cases only was the disease in its primary state.

Two cases of *vesico-vaginal*, and one of *recto-vaginal* fistula occurred. In the two former cases the mischief was the result of difficult parturition, and occurred at the first delivery. Both were submitted to a plastic operation; which in one resulted in a complete cure, and in the other to a considerable diminution of the opening, so the patient was discharged for a time before any further attempt should be made for the completion of the cure. In the last case, which occurred in a child aged seven years, it was the result of injury inflicted by the child falling across a stool which was placed legs uppermost, the injury having been caused about four months before admission. There was, on admission, an opening between the vagina and rectum about the size of a large pea, situated about one-third of an inch from the orifice of the vagina, through which some fæces escaped into the vagina. This was closed by a plastic operation, all except an orifice about the size of a pin-point, which would no doubt contract and be no inconvenience to the patient. One woman, aged 24, when confined two months before admission with her first child, had her *perinæum ruptured*; but as it was thought un-

advisable to attempt any operation just then, the patient was discharged for a time.

One case of *ovarian disease* was admitted, submitted to operation, and died on the fourth day after the operation. The patient, aged 42, was married, and had one child 20 years old. She had always enjoyed very good health, but twelve months before her first admission she noticed a swelling in the left side of her abdomen. Thirteen months before the operation she was in the Hospital, and was discharged for a time; three weeks before the operation she was tapped, and nine pints of fluid drawn off. At the time of operation there was dulness over the whole of the abdomen, except a space about the size of a small hand in the right loin; the greater part, especially at the left side, appeared to be solid. There was one patch about three by five inches a little above and to the right of the umbilicus, which gave a sensation of fluctuation. There was slight distress of breathing, but her health and spirits were good. Under the influence of chloroform an incision was made in the median line from about $2\frac{1}{2}$ inches above the umbilicus to about $4\frac{1}{2}$ inches below it. The tissues were dissected through, and the cyst arrived at, which was tapped, and about three quarts of dark-looking fluid drawn off. Having secured this with a pair of vulsellum forceps, another cyst was brought forward and tapped, which contained about a quart of fluid less dark than the former. The rest of the tumour being of a more solid nature was dissected out, and found to be very adherent to the intestines, especially on the left side, where the adhesions were so firm that they had to be cut through with scissors. The arteries that were cut through were in some cases as large as small quills, and were secured with the ordinary silk ligature. The pedicle was tied with silver wire passed through its middle, and the edges of the wound closed with silk sutures and strapping, and a broad flannel bandage fastened round the abdomen. The operation was performed on August 9th, about 1 P.M.

10th. There was repeated sickness during yesterday afternoon and during the night, but she has slept at intervals. She is now free from pain, pulse weak (108), and the sickness has somewhat abated. Small doses of morphia have been injected subcutaneously from time to time, and injection of beef-tea and port-wine given per rectum every few hours.

11th. The vomiting has been repeated frequently, and she complains of a feeling of exhaustion. Pulse 130, weak. Tongue somewhat brown and dry. On undoing the bandage, there was some tenderness and swelling on the left side of the abdomen.

12th. She is weaker; pulse 142. Sickness continues frequent. The swelling is somewhat less than yesterday, but there is a little emphysema in the left groin; slight healthy discharge from the wound.

Later in the day her eyes became sunken and her skin clammy, and she sank, and died on the morning of the 13th.

TABLE OF CASES ADMITTED DURING THE
YEAR 1867.

Nature of injury.	Total number of admissions.	Total number of deaths.	Percentage of mortality.	Complicated with other injury or disease.	Operations.
A. General injuries :					
<i>a.</i> Burns	41	19	46·3	3	
<i>b.</i> Scalds	27	6	22·2	1	
B. Local injuries :					
1. Of the head :					
<i>a.</i> Simple scalp-wounds . . .	73	1	1·3	9	
<i>b.</i> Scalp-wounds exposing bone . .	22	4	18·2	7	
<i>c.</i> Concussion	47	1	2·1	1	
<i>d.</i> Simple fracture	10	8	80	4	
<i>e.</i> Compound fracture	3	1	33·3		
<i>f.</i> Fracture of base	11	5	45·4		
<i>g.</i> Contusions	5				
<i>h.</i> Foreign body in ear	1				
2. Of the face :					
<i>a.</i> Fracture of lower jaw	7	1	14·3	1	
<i>b.</i> Dislocation	1				
<i>c.</i> Contusions of face	9				
<i>d.</i> Wounds of face	10				
<i>e.</i> „ „ eyelid	2	1	50	1	1
<i>f.</i> „ „ eyeball	6	1	16·7	1	
3. Of the back :					
<i>a.</i> Fracture of spine	2	2	100	1	
<i>b.</i> Sprains and contusions	34				
<i>c.</i> Concussion	2	1	50	1	
4. Of the neck :					
<i>a.</i> Cut-throat and wounds	8	2	25	1	
<i>b.</i> Contusions	5	1	20	1	
<i>c.</i> Wound of tongue	1				
5. Of the chest :					
<i>a.</i> Fractured ribs	27	6	22·2	8	
<i>b.</i> Contusions	9	1	11·1	2	
<i>c.</i> Wound of lung	1	1	100	1	
6. Of the abdomen :					
<i>a.</i> Contusions	5	1	20	1	
<i>b.</i> Injuries of scrotum	3				
<i>c.</i> „ „ labium	2				
<i>d.</i> Wounds of abdomen	1				

Nature of injury or disease.	Total number of admissions.	Total number of deaths.	Percentage of mortality.	Complicated with other injury or disease.	Operations.
B. Local injuries— <i>continued</i> .					
6. Of the abdomen:					
<i>e.</i> Ruptured viscus	3	3	100	1	
<i>f.</i> Fractured pelvis	1				
<i>g.</i> Ruptured pelvic viscus . . .	2	2	100	1	
7. Of the upper extremity:					
<i>a.</i> Contusions	9				
<i>b.</i> Wounds:					
<i>a.</i> Of shoulder	1				
<i>β.</i> „ arm	2				
<i>γ.</i> „ forearm	3			1	
<i>δ.</i> „ hand	11			1	
<i>c.</i> Fractures:					
<i>a.</i> Of clavicle	5			2	
<i>β.</i> „ humerus	5			1	
<i>γ.</i> „ forearm	9			2	
<i>δ.</i> „ scapula	2				
<i>d.</i> Compound fractures	10	4	40	2	7
<i>e.</i> Dislocations:					
<i>a.</i> Of humerus	4	1	25	1	4
<i>β.</i> „ elbow	1				1
<i>γ.</i> „ thumb	1	1	100	1	1
<i>f.</i> Sprains:					
<i>a.</i> Of wrist	2				
8. Of the lower extremity:					
<i>a.</i> Contusions	78	1	1·28	1	
<i>b.</i> Wounds:					
<i>a.</i> Of the thigh	16			1	
<i>β.</i> „ leg	20	1	5	4	
<i>γ.</i> „ foot	12	1	8·3	1	1
<i>c.</i> Simple fractures:					
<i>a.</i> Of the femur	46	1	2·1	3	
<i>β.</i> „ neck of femur	4	1	25	1	
<i>γ.</i> „ tibia	7				
<i>δ.</i> „ fibula	48			1	
<i>ε.</i> „ patella	15				
<i>ζ.</i> „ leg	67	3	4·4	4	1
<i>η.</i> „ foot	2	1	50	1	2
<i>d.</i> Comminuted fracture					
<i>e.</i> Compound fracture	17	3	17·6	2	2
<i>f.</i> Dislocation of hip	1				1
<i>g.</i> Sprains:					
<i>a.</i> Of hip	6			1	
<i>β.</i> „ knee	12			2	1
<i>γ.</i> „ ankle	48			1	
<i>h.</i> Gunshot wound	1	1	100	1	1
<i>i.</i> Ruptured artery	1	1	100	1	1
<i>k.</i> Fracture of stump	1				
C. Diseases (general):					
<i>a.</i> Erysipelas	32	2	6·2	15	3
<i>b.</i> Diffuse cellulitis	19	5	26·3	5	2

Nature of disease.	Total number of admissions.	Total number of deaths.	Percentage of mortality.	Complicated with other injury or disease.	Operations.
C. Diseases (general)— <i>continued</i> .					
c. Sloughing.	12	. . .	. . .	7	
d. Senile gangrene	2	1	50	1	
e. Traumatic „	1	1	100	1	1
f. Tetanus	4	2	50	3	1
g. Pyæmia	23	19	91	22	11
h. Gout.	1	. . .	. . .	1	
D. Diseases (local):					
1. Diseases of the organs of motion:					
a. Of bone:					
α. Abscess of bone. . . .	2				
β. Necrosis	59	3	5·08	5	20
γ. Caries	28	3	10·7	2	8
δ. Disease of spine . . .	26	1	3·8	2	
ε. Lateral curvature . . .	7				
ζ. Tumours of bone . . .	6	. . .	. . .	. . .	3
η. Rickets	1				
θ. Periostitis	20				
b. Of joints:					
α. Synovitis	93	. . .	. . .	2	3
β. Ulceration of cartilages .	16	. . .	. . .	1	1
γ. Abscess in joint. . . .	18	5	27·7	4	11
δ. Diseased ligaments . .	1				
ε. Hysterical joints . . .	2	. . .	. . .	2	
ζ. Rheumatism	2				
η. Ankylosis	10				
θ. Morbus coxæ	33	. . .	. . .	2	
ι. Loose cartilage	3				
c. Of bursæ:					
α. Inflamed bursa patella .	36				
β. „ other bursa	1	. . .	. . .	. . .	1
γ. Bursal tumours.	1	. . .	. . .	. . .	1
d. Of muscles, tendons, and their sheaths:					
α. Thecal abscess	9	. . .	. . .	1	1
β. Contracted tendons . .	14	. . .	. . .	. . .	3
γ. Effusion into sheaths . .	1				
δ. Abscess in muscle . . .	6				
ε. Ganglion	6				
ζ. Atrophy	1				
e. Deformity	1				
2. Diseases of the organs of circulation:					
a. Of the heart	3	2	66·6	2	
b. Of the arteries:					
α. Aneurysm	3	2	66·6	1	2
β. Nævus	2	. . .	. . .	. . .	2
c. Of the veins:					
α. Varicose veins	16	. . .	. . .	1	9
β. Phlebitis	2				
d. Of the absorbents and glands:					
α. Inflamed absorbents . .	5	. . .	. . .	1	

Nature of disease.	Total number of admissions.	Total number of deaths.	Percentage of mortality.	Complicated with other disease or injury.	Operations.
D. Diseases (local)— <i>continued</i> .					
2. Diseases of the organs of circulation :					
<i>d.</i> Of the absorbents and glands:					
<i>β.</i> Suppurating glands	21	1	4·7	1	
<i>γ.</i> Hypertrophy of glands	1	.	.	.	1
<i>e.</i> Secondary hæmorrhage	3	2	66·6	3	2
<i>f.</i> Hæmorrhage after extraction of tooth	1				
3. Diseases of the organs of respiration :					
<i>a.</i> Of the larynx	4	2	50	.	2
<i>b.</i> Bronchitis	5	1	20	5	
<i>c.</i> Phthisis	6	3	50	4	
<i>d.</i> Laryngeal phthisis	2				
<i>e.</i> Pneumonia	1	1	100		
4. Diseases of the nervous system :					
<i>a.</i> Of the brain and membranes :					
<i>α.</i> Epilepsy	1	.	.	1	
<i>β.</i> Meningitis	1				
<i>γ.</i> Delirium tremens	2	1	50	2	
<i>δ.</i> Organic disease	2	1	50	1	
<i>b.</i> Of the spinal cord :					
<i>α.</i> Paralysis infantum	3				
<i>β.</i> " partial	3	.	.	2	
<i>c.</i> Sciatica	3				
<i>d.</i> Hysteria	11	.	.	2	
<i>e.</i> Apoplexy	1	1	100		
<i>f.</i> Shock	1	1	100		
5. Diseases of the skin and appendages:					
<i>a.</i> Eruptions :					
<i>α.</i> Eczema	26	1	38·4	1	
<i>β.</i> Impetigo	3				
<i>γ.</i> Rupia	12	.	.	1	
<i>δ.</i> Psoriasis	7	.	.	1	
<i>ε.</i> Lepra	3				
<i>ζ.</i> Lupus	2				
<i>η.</i> Purpura	1				
<i>θ.</i> Ecthyma	1				
<i>ι.</i> Scabies	2				
<i>κ.</i> Erythema	1				
<i>λ.</i> Lichen	2	.	.	1	
<i>b.</i> Ulcers	112	1	·89	10	
<i>c.</i> Superficial abscesses	68	1	1·46		
<i>d.</i> Cancerous ulceration	5	2	40	1	2
<i>e.</i> Tumours :					
<i>α.</i> Fatty	8	.	.	.	7
<i>β.</i> Sebaceous	13	.	.	1	11
<i>γ.</i> Encysted	3				
<i>δ.</i> Malignant	2				
<i>f.</i> Carbuncles	4				
<i>g.</i> Boils	1				

Nature of disease.	Total number of admissions.	Total number of deaths.	Percentage of mortality.	Complicated with other disease or injury.	Operations.
D. Diseases (local)— <i>continued</i> .					
5. Diseases of the skin and appendages:					
h. Œdema	8				
i. Ulcer of stump	1				
k. Contracted cicatrix	1				
l. Onychia	6	. . . . .	. . . . .	. . . . .	1
m. Corns	1				
n. Elephantiasis	2	. . . . .	. . . . .	1	1
o. Ingrowing toenail	1				
6. Diseases of the eye and nose:					
a. Of the eye:					
α. Conjunctivitis	20	. . . . .	. . . . .	1	
β. Corneitis	17	. . . . .	. . . . .	. . . . .	1
γ. Sclerotitis	2				
δ. Iritis	10				
ε. Choroiditis.	1				
ζ. Cataract	11	. . . . .	. . . . .	. . . . .	4
η. Glaucoma	2				
θ. Granular lids	2				
ι. Staphyloma	1	. . . . .	. . . . .	. . . . .	1
κ. Strabismus.	3	. . . . .	. . . . .	. . . . .	3
λ. Destruction of eye	1	. . . . .	. . . . .	. . . . .	1
μ. Dislocation of lens	1				
ν. Abscess in ball	1				
ο. „ orbit.	1				
ρ. „ sac	1				
σ. Entropion	3	. . . . .	. . . . .	. . . . .	1
b. Of the nose:					
α. Polypus	2	. . . . .	. . . . .	. . . . .	2
7. Diseases of the organs of digestion:					
a. Of the mouth, pharynx, and œsophagus:					
α. Abscess in mouth	3				
β. Ulceration of mucous membrane	4				
γ. Sore-throat	2				
δ. Fissured palate	5	. . . . .	. . . . .	. . . . .	4
ε. Harelip	3	. . . . .	. . . . .	. . . . .	1
ζ. Enlarged tonsils	1	. . . . .	. . . . .	. . . . .	1
η. Cancer of tongue	2	. . . . .	. . . . .	. . . . .	2
θ. Epithelioma of lip	6	. . . . .	. . . . .	2	5
ι. Cancer of pharynx	1				
κ. „ œsophagus	1				
λ. Ranula	1				
b. Of the other organs of digestion:					
α. Strangulated hernia	26	8	30·7	5	22
β. Reducible „	13	. . . . .	. . . . .	1	
γ. Irreducible „	4				
δ. Peritonitis	5	5	100	1	
ε. Fæcal abscess	1				
ζ. Ulcer of rectum	2				

Nature of disease.	Total number of admissions.	Total number of deaths.	Percentage of mortality.	Complicated with other disease or injury.	Operations.
D. Diseases (local)— <i>continued</i> .					
7. Diseases of the organs of digestion :					
<i>b.</i> Of the other organs of digestion :					
<i>η.</i> Fistula in ano	26	. . . .	. . . .	. . . .	15
<i>θ.</i> Piles	18	. . . .	. . . .	. . . .	8
<i>ι.</i> Stricture of rectum	5				
<i>κ.</i> Polypus ani	4				
<i>λ.</i> Constipation	1				
<i>μ.</i> Cancer of rectum	5				
<i>ν.</i> Imperforate anus	1				
8. Diseases of the urinary organs :					
<i>a.</i> Of the bladder :					
<i>α.</i> Irritable bladder	3	. . . .	. . . .	1	1
<i>β.</i> Inflammation of bladder .	1				
<i>γ.</i> Hæmaturia	1				
<i>δ.</i> Stone in the bladder	8	1	12·5	. . . .	3
<i>ε.</i> Retention of urine	14	. . . .	. . . .	1	1
<i>b.</i> Of the urethra :					
<i>α.</i> Hypospadias	1	1	100	1	1
<i>β.</i> Vascular tumour	1				
<i>γ.</i> Stricture	36	1	2·77	2	2
<i>δ.</i> Spasmodic stricture	3				
<i>ε.</i> Fistula in perineo	9	1	11·1	. . . .	1
<i>ζ.</i> " " " and stone in urethra	1				
<i>η.</i> Enlarged prostate	8	2	25		
<i>θ.</i> Recto-urethral fistula . . .	2	. . . .	. . . .	. . . .	1
<i>ι.</i> Cystitis	3				
9. Diseases of the male organs of generation :					
<i>a.</i> Syphilis	11				
<i>b.</i> Secondary syphilis	14	. . . .	. . . .	1	
<i>c.</i> Gonorrhœa	2				
<i>d.</i> Warts	2				
<i>e.</i> Phimosis	11	. . . .	. . . .	1	9
<i>f.</i> Paraphimosis	2				
<i>g.</i> Bubo	6				
<i>h.</i> Hydrocele	9	. . . .	. . . .	. . . .	2
<i>i.</i> Acute orchitis	2				
<i>h.</i> Chronic "	6				
<i>l.</i> Scrofulous "	2				
<i>m.</i> Cancer of penis	1				
<i>n.</i> " " scrotum	1	. . . .	. . . .	. . . .	1
<i>o.</i> Hydrocele of cord	1				
<i>p.</i> Varicocele	3	. . . .	. . . .	. . . .	1
<i>q.</i> Hæmatocele	1	. . . .	. . . .	. . . .	1
10. Diseases of the female organs of generation :					
<i>a.</i> Of the breast :					
<i>α.</i> Inflamed breast	2				
<i>β.</i> Abscess of "	5				

Nature of disease.	Total number of admissions.	Total number of deaths.	Percentage of mortality.	Complicated with other disease or injury.	Operations.
D. Diseases (local)— <i>continued</i> .					
10. Diseases of the female organs of generation :					
<i>a.</i> Of the breast :					
<i>γ.</i> Milk-abscess	5				
<i>δ.</i> Scirrhus	11	1	9.09	1	5
<i>ε.</i> Chronic mammary tumours	4				
<i>ζ.</i> Serocystic tumours . .	2	. . . .	. . . .	. . . .	2
<i>b.</i> Of the other organs :					
<i>α.</i> Abscess of labium . .	2				
<i>β.</i> Malignant disease of labium	1				
<i>γ.</i> Hypertrophy of labium .	1				
<i>δ.</i> Gonorrhœa	1				
<i>ε.</i> Condylomata	3	. . . .	. . . .	. . . .	2
<i>ζ.</i> Syphilis	2				
<i>η.</i> Secondary syphilis . .	12				
<i>θ.</i> Leucorrhœa	1				
<i>ι.</i> Vesico-vaginal fistula .	2	. . . .	. . . .	. . . .	2
<i>κ.</i> Recto-vaginal „ . .	1	. . . .	. . . .	. . . .	1
<i>λ.</i> Laceration of perinæum .	1				
<i>μ.</i> Ovarian tumour . . .	1	1	100	. . . .	1

Table of Compound Fractures.

No.	Name, age, sex, No. in Register, surgeon.	Nature of accident.	Limb.	State of fracture.	Treatment and result.	Remarks.
1.	G. B. 40. M. (84, T.)	Was thrown off cab while drunk.	Right arm.	Comminuted fracture of lower end of humerus into elbow-joint. Wound about three inches long on inner and lower part of arm.	Angular splint.	Tetanus set in on the 15th day. For further detail, see report further on, under the head of Tetanus.
2.	T. L. 22. M. (230, T.)	A gun loaded with shot ac- cidentally went off.	Right arm.	The head, and about two inches of shaft of humerus with the ad- jacent portion of sea- pula, comminuted. Soft parts much bruised. Large wound in front of shoulder.	Removal of fragments of bone and about 3 inches of humerus. Died.	Was much collapsed on admis- sion. Extensive sloughing and profuse discharge ensued, and he died of exhaustion.
3.	D. T. 68. M. (292, P.)	Was jammed between the wheel of a cart and a wall.	Right arm.	Fracture of external condyle running down into the joint, with extensive laceration of soft parts.	Side angular splint. Secon- dary amputa- tion. Died, 20 days.	
4.	T. D. 16. M. (296, P.)	Fell from rail- way engine, and wheel passed over his foot.	Right leg.	Bones of foot smashed, inner malleolus com- minuted, and exten- sive laceration of soft parts.	Primary ampu- tation. Reco- vered.	

5.	P. M. 49. M. (596, H.)	Was pushed down in a street row.	Right leg.	Oblique fracture of both bones, with the tibia projecting through the skin.	Assallini's box. Died, 19 days.	There was considerable bruising. Suppuration and sloughing of the skin occurred, at the end of the second week of which he died.
6.	T. W. 56. M. (770, H.)	Was removing a wheel of a cart, which fell on to his leg.	Right leg.	Oblique fracture of both bones, lower third with small punctured wound.	Assallini's box. Wound closed with lint and collodion. Recovered, 45 days.	
7.	T. S. 26. M. (848, T.)	Run over by a railway train.	Both legs and right thigh.	Lower part of both legs smashed up. Right knee-joint laid open. Transverse fracture of lower third of right femur, with the bone protruding.	Assallini's box. Stimulants. Died shortly after admission.	
8.	W. C. 32. M. (856, T.)	Fell about 70 feet off a scaffold.	Both legs and arm.	Comminuted compound fracture of both legs in upper part. Upper part of left humerus smashed up, and soft parts much lacerated.	Assallini's box. Died 4½ hours after admission.	
9.	T. W. 14. M. (1055, P.)	Bough of tree fell across his leg.	Left leg.	Fracture of both bones in middle. Small punctured wound. Good deal of bruising.	Assallini's box. Pad of dry lint. Pasteboard splints on 31st day. Recovered, 35 days.	Some blebs formed near the wound, but the wound healed without suppuration under the pad of lint.

No.	Name, age, sex, No. in Register, surgeon.	Nature of accident.	Limb.	State of fracture.	Treatment and result.	Remarks.
10.	A. H. 26. M. (1407, P.)	Thrown out of gig, which fell over on to his leg.	Left leg.	Oblique fracture of both bones in middle. Wound $\frac{1}{4}$ inch long. Large extravasation of blood.	Assallini's box. Lint and col- lodion on wound. Side- splints, 17th day. Paste- boards, 25th day. Reco- vered, 29 days.	There was a little oozing of blood during the first night, so the lint was again painted over with collodion, and the wound healed without any suppu- ration; the lint separating on the 17th day, leaving only a small raw surface.
11.	T. O. 36. M. (1879, P.)	Fell off a rail- way truck, and both wheels passed over his arms.	Both arms.	Left humerus smashed up to within two inches of shoulder. Right in same state, but not extending quite so high up. Soft tissues very much bruised and lacerated.	Primary ampu- tation of both arms. Died, 3 days.	Never fully rallied from the shock.
12.	W. P. 40. M. (1903, P.)	Stone of about 5 cwt. fell on to his leg.	Left leg.	Oblique fracture of both bones. Small wound size of pea. Lower end of upper fragment very sharp and pro- minent.	Assallini's box. Lint and col- lodion. Lint removed on the 12th day. Pasteboards on 59th day. Recovered, 64 days.	Suppuration occurred at wound, and small shell of bone exfoli- ated. Patient recovered, with very good leg.

13.	W. B. 60. M. (1953, Ho.)	Slipped up on to right elbow.	Right el- bow.	Comminuted fracture of olecranon, with small wound and abscess in joint.	Straight inside splint, and free incisions into abscess. A n g u l a r splint. Re- covered, 56 days.	The accident occurred four days before admission. When ad- mitted was in very weak state. There was subsequently bur- rowing of matter about joint, and considerable amount of bone could be felt exposed and rough. Discharged much stronger, with sinuses still dis- charging slightly.
14.	T. R. 49. M. (1961, Ho.)	Thrown out of cart, wheel passing over his leg.	Right leg.	Oblique fracture of both bones, lower third; with jagged wound about two inches long, through which about four inches of the tibia protruded; de- nuded in its greater part of periosteum.	Projecting por- tion of bone removed. As- salini's box. Wound treat- ed a f t e r Lister's plan with carbolic acid. Reco- vered, 138 days.	There were but very slight con- stitutional symptoms, and the patient was discharged with very useful leg.

TABULAR STATEMENT OF OPERATIONS PERFORMED DURING THE YEAR 1867.
CLASS I. *Operations on the Head, Neck, and Face.*

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
1.	Sarah C. (1193, P.)	27	F.	Myeloid tumour of upper jaw.	Removal of upper jaw, leaving only the orbital plate.	Recovered, 23 days.	The wounds on the face healed by first intention. The disease was confined to the alveolar ridge and the under-surface of the hard palate.
2.	Edward D. (1645, Hol.)	49	M.	Malignant growth, commencing in the antrum.	Removal of growth and greater part of the upper jaw.	Recovered, 25 days.	The growth had destroyed the bone, which came away piecemeal. Upper lip of that side sloughed after the operation, and the disease returned about eight weeks afterwards.
3.	Herman F. (223, Hol.)	58	M.	Epithelioma of tongue.	Removal of the whole of tongue.	Recovered, 42 days.	By dividing the symphysis of the lower jaw, the écraseur was easily put round the root of the tongue.
4.	Thomas W. (839, Hol.)	43	M.	Epithelioma of tongue.	Removal of growth.	Recovered, 4 days.	The growth, which was small and limited to one side of the tongue, was removed with the knife.
5.	Fred. L. (437, P.)	24	M.	Cleft of soft palate.	Staphyloraphy.	Recovered, 6 days.	The cleft almost entirely closed.
6.	Horace D. (1375, P.)	16	M.	Cleft of hard and soft palates.	Staphyloraphy.	Recovered, 14 days.	Union of the greater part of soft palate took place.

7.	Ann J. (1475, L.)	16	F.	Cleft of soft palate.	Staphyloraphy.	Recovered, 9 days.	The cleft in the hard palate almost entirely closed by an operation in the early part of the present year. No union had taken place when the stitches were removed on the eighth day.
8.	John E. (1555, Hol.)	13	M.	Cleft of both hard and soft palates.	Staphyloraphy.	Recovered, 9 days.	The soft palate only was operated on, and about half united. Chloroform was administered, and Mr. T. Smith's gag em- ployed to keep the mouth open.
9.	James W. (592, Md. Rg. L.)	46	M.	Tumour of larynx.	Laryngotomy.	Died, 42 days.	The tube was removed, and before it could be rein- troduced the patient died. There was extensive en- cephaloid disease in the larynx.
10.	Sophia C. (1237, P.)	29	F.	Syphilitic disease of larynx.	Laryngotomy.	Recovered, 21 days.	The patient had the tube in when discharged.
11.	Charles S. (1926, Pow.)	41	M.	Disorganisation of eyeball.	Excision of eyeball.	Recovered, 13 days.	The eye had been destroyed twenty-three years, and was beginning to set up irritation.
12.	Ann C. (1853, Pow.)	11	F.	Destruction of eye.	Abscission of eyeball.	Recovered, 23 days.	The back part of eyeball was left to make a better cushion for an artificial eye.

Besides the above operations, there were: two for removal of nasal polypi, one for removal of cancer of lip, one plastic on the upper eyelid, five for necrosed bone, and fifteen for removal of tumours.

CLASS II.

Operations on the Upper Extremity.

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
1.	Emily D. (2076, Reg. of 1866, L.)	20	F.	Disease of humerus and ulna.	Amputation of arm by flaps.	Recovered, 23 days.	The elbow-joint had been previously excised.
2.	George G. (191, L.)	43	M.	Malignant ulceration.	Circular amputation of arm.	Died, 27 days.	Pyæmia set in on the 15th day.
3.	Henry K. (765, Hol.)	59	M.	Diffuse cellulitis of hand, and abscess in wrist-joint.	Amputation of forearm by flaps.	Recovered, 48 days.	
4.	John O. (1879, P.)	36	M.	Compound fracture of both arms.	Amputation of both arms (primary).	Died, 3 days.	The patient never rallied after the accident.
5.	Joseph L. (230, T.)	22	M.	Compound fracture of upper part of humerus, into the shoulder-joint.	Primary removal of head and about two inches of shaft of humerus.	Died, 12 days.	The accident was the result of a gunshot. There was considerable sloughing of the skin and profuse purulent discharge, from which the patient sank.

6.	John B. (1379, P.)	18	M.	Abscess of elbow-joint.	Excision of joint.	Recovered, 56 days.	The patient was in a very emaciated condition, but rapidly improved after the operation.
7.	Thomas L. (102, H.)	34	M.	Epithelial growth over shoulder.	Removal with knife.	Recovered, 29 days.	
8.	Susan R. (1636, Hol.)	21	F.	Nævus of forearm.	Excision.	Recovered, 4 days.	An attempt was made to save the skin over it by dissecting it off, but the nævus was partly consolidated, and the greater part of the skin sloughed.

There were also in this class, eight cases in which part of the hand was removed; two cases of removal of necrosed bone; two of removal of fatty tumours; and six reductions of dislocations.

CLASS III.
Operations on the Thorax.

No.	Name, No. in Register. and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
1.	Ann T. (563, L.)	52	F.	Scirrhus of breast.	Amputation of breast.	Recovered, 20 days.	The bleeding was arrested by acupressure needles, and there was slight hæmorrhage, which necessitated the opening of the wound.
2.	Susan S. (1327, L.)	50	F.	Scirrhus of breast.	Amputation of breast.	Recovered, 20 days.	Hæmorrhage arrested with acupressure needles, which were removed on the 5th day.
3.	Susan G. (1572, B.)	45	F.	Scirrhus of breast.	Amputation of breast.	Recovered, 56 days.	An attack of cutaneous erysipelas delayed the healing.
4.	Mary B. (1634, Hol.)	44	F.	Scirrhus of breast.	Amputation of breast.	Recovered, 27 days.	Vessels secured with acupressure needles.
5.	Martha B. (1863, H.)	44	F.	Scirrhus of breast.	Amputation of breast.	Recovered, 50 days.	There were also some enlarged glands in the axilla, which were removed.

6.	Ann P. (1221, T.)	44	F.	Tubero-cystic tumour of breast.	Amputation of breast.	Recovered, 35 days.	The tissues were very vas- cular; so sutures were not introduced till the next day.
7.	Cecilia W. (18, Hol.)	48	F.	Tubero-cystic tumour of breast.	Removal of tumour.	Recovered, 19 days.	
8.	Maria G. (1457, B.)	37	F.	Scirrhous of breast.	Introduction of points of chloride of zinc.	Died, 2 months.	The whole of breast slough- ed, and came away on the 16th day, leaving a very extensive raw surface with the ribs exposed in two places. Symptoms of pyæmia set in six days before her death.
9.	James B. (1450, B.)	51	M.	Hypertrophy of glands in axilla.	Excision of mass.	Recovered, 21 days.	

Four fatty tumours were also removed.

CLASS IV.
Operations on the Abdomen.

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
1.	Lydia C. (41 L.)	26	F.	Femoral hernia of right side, 3½ years. Truss always worn. Strangulated, 6½ hours. Femoral hernia of left side 6 months' standing.	Sac not opened.	Recovered, 43 days.	There were some slight abdominal pains after the operation.
2.	Martha H. (118 H.)	70	F.		Sac opened. About 3 inches of small intestine greatly congested, with 1 oz. of serum.	Recovered, 26 days.	Ice had been applied prior to admission. Tumour size of walnut, very tender, and skin red. The sac was almost dry, and the stricture very tight. The gangrene did not implicate the entire circumference of gut, which was opened and stitched to the edges of the wound. The omentum was ligatured and cut off. Was much exhausted on admission, and never rallied. Vide Post-mortem Book No. 29.
3.	Lydia A. (158 P.)	46	F.	Recent femoral hernia of right side. Strangulated, 106 hours.	Sac opened, and contained a small piece of omentum almost gangrenous, a knuckle of small intestine quite gangrenous in one part, and semi-purulent lymph.	Died 39¾ hours after operation.	

4.	James T. (206 L.)	27	M.	Recent inguinal hernia. Strangulated, 9 hours. Right side.	Sac opened, and contained omentum and small intestines slightly congested.	Recovered, 23 days.	The symptoms were urgent. During the operation the small intestine and some omentum were forcibly protruded, and a rent was found in the sac. Some difficulty was experienced in returning the bowel. This patient had been treated with purges before admission.
5.	Joseph M. (252 B.)	29	M.	Inguinal hernia of 3 years' standing. No truss worn.	Sac not opened.	Recovered, 19 days.	Gimbernat's ligament, and the deep crural arch, were both divided before the gut could be returned.
6.	Sarah S. (293 Hol.)	40	F.	Recent femoral hernia. Strangulated, 31 hours.	Sac, thin and tense, was opened, and contained a small quantity of bloody fluid, and a knuckle of small intestine somewhat congested.	Recovered, 21 days.	The stricture was formed by intercolumnar fibres.
7.	George H. (275 Hol.)	40	M.	Old inguinal hernia of left side of 18 years' standing. No truss had been worn. Strangulated, 9½ hours.	Sac not opened.	Recovered, 17 days.	
8.	Charles S. (298 P.)	72	M.	Bubonocoele of left side of 1 year's standing. No truss had been worn. Strangulated, 3 days.	Sac opened, and contained a small quantity of dark bloody putrid fluid, a piece of omentum, and some 6 inches of small intestine not much congested.	Died, 26 days.	A pad and bandage had been worn, and there was distinct impulse in tumour. The bowels acted naturally on the 9th day after the operation, and on the 18th there was a faecal taint in the discharge from the wound. On the 11th day there was an escape of faeces from wound.

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
9.	Martha S. (426 B.)	30	F.	Femoral hernia of right side of 12 months' standing. No truss had been worn. Strangulated, 50 hours.	The sac was not opened, but the contents appeared somewhat congested.	Recovered, 42 days.	
10.	William H. (621 P.)	37	M.	Inguinal hernia of left side of 2 years' standing. Truss had been worn. Strangulated, 3½ hours.	The sac was not opened.	Recovered, 16 days.	The symptoms were very urgent, and the stricture tight.
11.	James M. (807 L.)	16	M.	Inguinal hernia of right side of 1 month's standing. No truss had been worn. Strangulated, 48 hours.	The sac was opened, and contained several ounces of straw-coloured fluid, and a considerable amount of small intestine.	Recovered, 54 days.	
12.	Ellen S. (819 Hol.)	70	F.	Femoral hernia of right side, of 2 years' standing. No truss had been worn. Strangulated, 4 days.	The sac was opened, and contained a knuckle of small intestine very congested, and a small amount of bloody serum.	Died, 9 days.	Was attacked with erysipelas on the 5th day after the operation, but got the better of this, dying on the 9th day of the effects of ulceration of the gut in the course of the stricture.
13.	James C. (923 P.)	35	M.	Inguinal hernia of right side, 16 years. No truss had been worn. Strangulated, 13 hours.	The sac was opened, and contained a considerable amount of large intestine, and a large mass of omentum.	Recovered, 37 days.	There were evident symptoms of peritonitis, but these passed away, and the patient recovered.

14.	Alfred B. (1105 B.)	4½	M.	Bubonocoele of right side as long as he remembers. Truss had always been worn.	The sac was not opened.	Recovered, 17 days.	
15.	Sarah S. (1147 Hol.)	70	F.	Femoral hernia of right side of 40 years' standing. Truss always worn. Strangulated, 3½ days.	Sac opened, and contained a few drops of dark-coloured fluid, about 4 inches of gut not very congested, and a little recent lymph.	Recovered, 21 days.	Though the bowels had not acted, and there had been sickness for 3½ days, there was impulse just before the operation.
16.	Rees D. (1345 B.)	40	M.	Scrotal hernia of left side, 11 years, which had never been reduced. Strangulated, 22 hours.	Sac opened, and contained a small portion of omentum, and a very large portion of small intestine, neither very congested, adherent to sac.	Died, 10 hours.	On admission, there was a hernia the size of human head, but no symptoms of strangulation. It was irreducible, and a bag of shot was applied. Four days later symptoms set in.
17.	John T. (1616 L.)	44	M.	Scrotal of left side, of 9 years' standing. Had never worn a truss. Strangulated, 26 hours.	Sac opened, and contained about 1 oz. of serum on point of suppurating, a large portion of omentum almost gangrenous, and about 3 inches of gut with patches of slough on surface.	Died, 4 days.	Peritonitis set in, the symptoms of strangulation passing without abatement into those of peritonitis.
18.	William R. (1661 Hol.)	21	M.	Recent congenital hernia of left side. Strangulated, 5 hours.	Sac opened, and contained 4 inches of gut very slightly congested. Stricture situated at the internal ring.	Recovered, 23 days.	

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
19.	James S. (1768 L.)	22	M.	Inguinal hernia of right side, of 10 years' standing. Strangulated, 12 hours.	Sac opened, and contained about $\frac{1}{2}$ oz. of serous fluid, and two pieces of gut separated by a firm band. The first returned without difficulty, and then, after dividing the band, the second one. They were about 4 and $1\frac{1}{2}$ inches long respectively. Neither very congested.	Recovered, 37 days.	There was some suppuration in sac after the operation. Up to the time of operation there was a distinct impulse in the tumour.
20.	Charles D. (1886 P.)	36	M.	Inguinal hernia of left side, of 10 years' standing. Had always worn a truss. Strangulated, 26 hours.	Sac opened, and contained about $1\frac{1}{2}$ oz. of bloody fluid, mass of omentum size of fist very congested, and in places almost gangrenous, and a small knuckle of intestine slightly congested.	Died, 4 days.	A double ligature was passed through the base of the mass of omentum, tied, and the mass cut off. Died of peritonitis.
21.	Eliza H. (1931 L.)	46	F.	Umbilical hernia. Had worn pad. Strangulated, 48 hours.	Sac opened, and contained 2 inches of small intestine, with flakes of lymph on surface.	Died, 36 hours.	She came into the Hospital 2 days before the operation, and the hernia was thought to be reduced, but the symptoms continued, and stricture found in abdominal walls.

22.	Alfred B. (1930 L.)	26	M.	Inguinal hernia of right side, of 7 years' stand- ing. Had never worn a truss. Strangulated, 12 hours.	Sac opened, and contained about $\frac{1}{2}$ oz. of bloody fluid, and $2\frac{1}{2}$ inches of gut considerably bruised.	Died, $3\frac{1}{2}$ days.	Suppuration was set up in sac and peritonitis.
23.	Margaret W. (1911 med. reg. H.)	42	F.	Ovarian tumour, of 2 years' standing. Once tapped.	Ovariectomy.	Died on 4th day.	For detail of this case, see report further on under the head of "Diseases of the Female Organs of Generation."

Besides the above, there were fifteen operations for the cure of fistula in ano, and eight for the cure of hæmorrhoids, together with one for the removal of a polypus from the rectum.

CLASS V.
Operations on the Genito-Urinary Organs.

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
1.	Robert W. (947 Hol.)	34	M.	Urethral fistula.	Plastic operation.	Died, 12 days.	Symptoms of pyæmia set in on the 5th day, and secondary abscesses formed.
2.	James M. (1369 P.)	62	M.	Epithelioma of scrotum.	Removal of growth.	Recovered, 34 days.	The disease extended over the greater part of the scrotum, and only just enough sound skin was found to cover the testes.
3.	Arthur H. (687 Hol.)	37	M.	Impermeable stricture.	Perineal section.	Recovered, 2 months.	
4.	William H. (305 P.)	29	M.	Old stricture and abscess in perinæum.	Perineal section.	Recovered, 29 days.	
5.	Ely F. (825 L.)	31	M.	Impermeable stricture.	Perineal section.	Recovered, 24 days.	
6.	Samuel C. (1371 P.)	63	M.	Impermeable stricture and perineal fistulæ.	Perineal section.	Recovered, 2 months.	
7.	Alfred L. (155 P.)	20	M.	Vesical calculus.	Lithotomy.	Recovered, 128 days.	There was some difficulty in extracting the stone, and an opening between the rectum and the lower part of the urethra was formed.
8.	John D. (917 P.)	11	M.	Vesical calculus.	Lithotomy.	Recovered, 35 days.	

9.	Henry S. (1262 L.)	3	M.	Vesical calculus.	Lithotomy.	Recovered, 38 days.	The stone was situated in the lower part of the urethra on admission, and produced retention of urine. The operation was lateral, but the incision prolonged outwards in a quarter circle. See No. 7. No union took place.
10.	Alfred L. (1669 P.)	21	M.	Recto-urethral fistula.	Plastic operation.	Recovered, 28 days.	The opening, which was about the size of large pea, and the result of injury, was closed almost entirely.
11.	Elizabeth R. (1058 P.)	7	F.	Recto-vaginal fistula.	Plastic operation.	Recovered, 52 days.	The opening was nearly large enough to admit of the introduction of two fingers, and when the sutures were removed on the 24th day, union was found to be perfect throughout.
12.	Lavinia N. (266 P.)	31	F.	Vesico-vaginal fistula.	Plastic operation.	Recovered, 27 days.	The opening was about the size of the thumb-nail, and when the sutures were removed on the 21st day about $\frac{1}{4}$ was found healed.
13.	Elizabeth W. (1504 Hol.)	27	F.	Vesico-vaginal fistula.	Plastic operation.	Recovered, 27 days.	

Besides the above operations, there were nine of circumcision, two for the cure of hydrocele, one for varicocele, one for hæmatocele, and two for the removal of condylomata.

CLASS VI.

Operations on the Lower Extremity.

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
1.	Ann L. (50 T.)	47	F.	Abscess of knee-joint.	Circular amputation of thigh.	Died, 13 days.	The vessels were secured with silver wire, the ends of which were cut off short and left in the stump. The edges were brought together with silver sutures and painted with collodion. Small portion healed by first intention, but pyæmia set in on the 6th day, and she died 6 days later.
2.	Mary Ann W. (433 P.)	45	F.	Abscess of knee-joint.	Amputation of thigh by double semilunar flap.	Died, 12 days.	
3.	Harriett A. (606 P.)	35	F.	Abscess of knee-joint and dislocation.	Amputation of thigh by double semilunar flap.	Recovered, 32 days.	The vessels secured, and the stump treated in the same way as the previous case. A great part of the wound healed by first intention. No unfavourable symptom occurred after the operation.

4.	Frederick J. (608 P.)	17	M.	Strumous disease of knee-joint.	Amputation of thigh by double semilunar flap.	Recovered, 27 days.	Vessels secured, and stump treated as in previous case, considerable portion healing by first intention.
5.	Richard D. (1734 of Reg. 1866, H.)	9	M.	Necrosis of patella and abscess in knee-joint.	Circular amputation of thigh.	Recovered, 79 days.	There was extensive burrowing of matter up the thigh, and the tissues were so oedematous that the edges were not brought together.
6.	Joseph T. (1041 B.)	41	M.	Hæmorrhage after ligature of the femoral artery.	Amputation of the thigh in its upper third by double semilunar flap.	Died the next morning.	This patient was in a very weak condition at the time of the operation (see Injuries of the Lower Extremity), and died of exhaustion.
7.	Ann L. (1157 Hol.)	40	F.	Epithelioma of leg.	Amputation of thigh by double semilunar flap.	Died, 4½ days.	There was some secondary hæmorrhage on the 3d day, and the patient sank.
8.	Eliza B. (1181 H.)	35	F.	Abscess in knee-joint.	Circular amputation of middle of thigh.	Recovered, 27 days.	This patient was in a very exhausted condition, but improved rapidly after the operation.
9.	Charles W. (1445 B.)	26	M.	Hæmorrhage from aneurysm in popliteal space.	Amputation of thigh by double semilunar flap.	Died, 19 days.	Died of pyæmia. (See also Diseases of the Organs of Circulation.)
10.	John W. (1987 Hol.)	30	M.	Gangrene after gunshot wounds of leg.	Amputation of thigh by double semilunar flap.	Died as soon as the operation was over.	The patient was moribund at the time of operating.

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
11.	Thomas F. (1940 L.)	36	M.	Extensive sloughing and abscess after fracture of the leg.	Amputation of thigh by rectangular flaps, the anterior being the long one.	Died, 6 days.	The vessels were secured with acupuncture needles, the sciatic nerve being also compressed by one of the needles. Tetanus set in on the 5th day, and the patient died. (See also under the head "General Diseases.")
12.	Joseph D. (296 P.)	16	M.	Compound comminuted fracture of leg and foot.	Primary amputation of leg by rectangular flaps.	Recovered, 39 days.	
13.	Henry S. (59 Hol.)	11	M.	Necrosis of tibia and abscess in ankle-joint.	Amputation of leg by double flap.	Recovered, 23 days.	
14.	Lucy P. (782 L.)	35	F.	Caries of astragalus and lower end of tibia.	Amputation of leg by rectangular flap—long posterior.	Recovered, 56 days.	
15.	William H. (850 Hol.)	45	M.	Compound comminuted fracture of os calcis, and sloughing.	Circular amputation of upper third of leg.	Recovered, 61 days.	
16.	George B. (1111 H.)	35	M.	Caries of tarsus.	Amputation of leg by rectangular flap—long posterior.	Recovered, 62 days.	
17.	Eliza W. (1441 L.)	35	F.	Caries of astragalus and ulceration of cartilages of ankle-joint.	Amputation of leg by rectangular flap—long posterior.	Recovered, 96 days.	Small portion of the posterior flap sloughed, and the end of tibia was exposed; but the patient eventually recovered, with a good stump.

18.	Phillis E. (1330 B.)	57	F.	Sloughing of leg, and abscess in ankle-joint.	Amputation of leg by double semilunar flaps.	Died, 15 days.	Portion of skin sloughed, and pyæmia set in on the 10th day.
19.	John S. (1735 Hol.)	18	M.	Extensive sloughing after injury to the foot.	Amputation of leg by double semilunar flaps.	Died, 14 days.	Was in a hectic condition at the time of the operation, and pyæmia manifested itself on the 9th day.
20.	Amelia P. (1362 T.)	8 mos.	F.	Hypertrophy of foot.	Amputation of foot at ankle-joint.	Recovered, 54 days.	See prep. in Museum.
21.	Eliz. C. (469 L.)	14	F.	Disease of hip.	Excision of joint.	Recovered, 5 months.	When discharged she could bear some weight on the limb, which was 2 inches shorter than the other.
22.	Edward K. (173 L.)	7	M.	Abscess of knee-joint.	Excision of knee.	Recovered, 63 days.	
23.	Emma W. (387 T.)	16	F.	Strumous disease of knee.	Excision of knee.	Recovered, 80 days.	
24.	William C. (481 L.)	21	M.	Strumous disease of knee.	Excision of knee.	Died, 20 days.	Symptoms of pyæmia set in on the 10th day.
25.	Luther W. (670 L.)	4	M.	Strumous disease of knee.	Excision of knee.	Recovered, 157 days.	
26.	Anthony B. (791 L.)	9	M.	Strumous disease of knee.	Excision of knee.	Recovered, 116 days.	
27.	Stephen R. (1901 L.)	12	M.	Old abscess of knee-joint with dislocation.	Excision of knee.	Recovered, 65 days.	There was 5½ inches shortening when discharged. The limb was considerably wasted, and the femur was sawn through about ¼ of an inch above the epiphysis.

No.	Name, No. in Register, and surgeon.	Age.	Sex.	Nature of disease.	Nature of operation.	Result, and at what date.	Remarks.
28.	Sidney M. (602 Hol.)	5	M.	Caries of os calcis.	Excision of os calcis.	Recovered, 56 days.	The boy's health improved after the operation. The wound almost healed when he was discharged with a plaster-of-paris splint on.
29.	William P. (239 B.)	46	M.	Femoral aneurysm.	Ligature of femoral artery.	Died, 11 days.	Secondary hæmorrhage occurred at the seat of ligation. (See Diseases of the Organs of Circulation.)
30.	Joseph T. (1041 B.)	41	M.	Rupture of femoral artery.	Ligature of femoral artery.	Died, 13 days.	Hæmorrhage set in, and the thigh was amputated. (See No. 6 of this table. See also Injuries of the Lower Extremity.)
31.	Caleb T. (215 T.)	16	M.	Exostosis of femur.	Removal.	Recovered, 20 days.	
32.	Joseph McG. (1304 P.)	46	M.	Bursal tumour over sacrum.	Removal.	Recovered, 14 days.	The patient was an old cavalry soldier, and the tumour situated where the back of saddle would rub him.
33.	Mary Q. (1279 L.)	29	F.	Enlarged bursa patellæ.	Removal.	Recovered, 24 days.	

Besides the above, there were seven cases in which part of the foot was removed, fifteen operations for dead bone, one reduction of dislocated hip, and eight operations for the cure of varicose veins.

WILLIAM LEIGH,
Surgical Registrar.

October 1868.

ADDRESS TO THE STUDENTS OF ST. GEORGE'S HOSPITAL.*

IN the olden days, men made much of climacteric periods and critical times. As in individuals, so in nations and in institutions, there are climacteric periods—periods in which notable changes take place, often harbingers of future and increasing strength. One of these periods St. George's Hospital has reached. I thank you for permitting me, an old pupil, far removed from your labour and success, to join you once more. I shall be glad if what I presume to say this day may be in accord with the sentiments which friends, teachers, pupils must naturally feel on this auspicious occasion.

The subjects which crowd upon the mind when it contemplates the work in which you are this day engaged are numerous and weighty—"The opening a new Medical School! the extension of the Hospital!" Few words, pregnant with deep meaning! The training a man according to new methods, for the science and practice of medicine as they now are—the settling the literary and scientific basis on which this new School is to take its stand—the decision how much of this training is to be carried on in the Hospital—whether it is to be scornful of the past and confident of the present, or critically selective of both.

The extension of the Hospital! What! Not yet large enough: yet more population needing and obtaining voluntary aid; greater inequality, deeper misery in the midst of so much material comfort and accumulated wealth! What problems rise before us! Education, march of knowledge,

* Delivered on the opening of the new School, October 1, 1868, by Henry W. Acland.

pressure of civilisation, social government, the future! We cannot pursue them. We must keep our thoughts in narrower bounds, and attend more especially to what concerns this Hospital and your School. That field is large enough, as the younger students, whom chiefly I wish to address to-day, will presently see.

You are entering a new School. The old one was inconveniently placed and inadequate. It was greatly in advance of what had existed before; but it had lived its term, though scarcely thirty years old. Your new School is conveniently placed, with provision for every want, and constructed with such considerate care as to make coarseness or levity (properties once attributed, by those who took no pains to lessen them, to medical students) wholly out of place. On the very ground where betting-men strove to conceal behind a practised air of nonchalance their losses or their gains, you will henceforward be studying, with all the help which thoughtful care can provide, the scientific foundation on which the art of healing depends, and will be preparing yourselves to use aright the wards of the Hospital.

The Hospital itself has been, at the same time, extended. New wards are added. The Out-patients' department—a department instructive, useful, and valuable—is remodelled; and not to fatigue you with what you know so well, I refer you to the Hospital itself, its Reports, and its Managers.

Apart, however, from these provisions, common more or less to great Hospitals, there are in this Hospital of St. George characteristics so special that to-day they must not be forgotten. It might have been your glory to have originally administered a great endowment, founded by the wisdom of a monarch, or the generosity of a merchant prince. You might have had the satisfaction of being in the heart of a district where the very surroundings compelled your benevolence. You had no such origin, no such naturally assigned duties. Taking your rise during the last century from the internal disputes of a Dispensary Board, you were placed “betwixt town and country,” without funds, with friends. Your predecessors did the work of their day, as you are doing the work of yours, enlarging, extending, till by the very force of your necessities your walls press on the

mansions of the wealthy, and your students now labour where horses trampled before. From your windows the sick, who throng your wards, daily look down on that unparalleled crowd, through which the richest and the fairest are borne by animals, in their kind, as rich and as fair; are jostled by spectators of every degree, from those as wealthy as themselves, to some whose squalid misery is as hard to endure as the sickness of your inmates; from the innocent seekers of rest and freshness, to the unhappy and sorrow-bringing candidate for shortlived and evil fame:—a suggestive microcosm, from which students at the doors, or patients from their beds, as they look over them all to the historic mansion of the strong and simple Duke, may draw many and strange reflections; a scene such as elsewhere they can scarcely witness, which centuries of constitutional life alone can produce, and in the midst of which your house is significantly placed. Only let it be added, or the scene is incompletely sketched, that not far from you is the frequent home of Florence Nightingale, not far off was the home of Sidney Herbert, and near at hand, the memory of our Student-Prince. All these associations proclaim to the medical student, to the poor and the sick, that amid that glitter and that throng your work is valued, and their need is known; and that through this active sympathy it has come about that this great edifice has steadily grown to its present greatness on such a site—an instance of that of which Montalembert wrote—“ ‘ Supported by Voluntary Subscription:’ telle est la fière et noble inscription qu’on lit dans toute l’Angleterre sur la façade de la plupart des hôpitaux, des hospices, des asiles divers de la misère humaine. On comprend bien que ces mots: ‘ entretenus par les souscriptions volontaires’ impliquent ceux-ci: ‘ gouvernés par l’autorité des souscripteurs.’ C’est toujours le même principe: l’effort, le sacrifice personnel et permanent, puis le droit et le pouvoir naissent du sacrifice et de l’effort. Tant que ce principe sera en force et en honneur, l’Angleterre n’aura rien à craindre.”

Although the above considerations naturally and not uselessly present themselves, they sink into insignificance when compared to other peculiarities of your Hospital, and of which, in discharge of my duty to-day, I proceed, however trite they

may seem to some, to remind you. Without detracting at all from the great merits of the roll of the other eminent physicians and surgeons who have served and adorned this institution, there are two whose character and whose teaching are so intimately bound up with St. George's, that it will not be a waste of our time to consider, at this epoch of our history, whether we are right, and why we are right, in looking on John Hunter and Sir Benjamin Brodie as so great benefactors to our profession and to mankind. No excuse is needed for naming them to-day. While there are students with young hearts and keen intellects, the same tale must be often told, and yet be ever new.

Hunter and Brodie together represent biological science and surgical practice, each in its highest aspect. Not that either was devoted to science to the exclusion of practice, or to practice to the exclusion of science. Still, had Hunter possessed affluence, it is doubtful whether he would have pursued practice at all: and with all Sir Benjamin's keen love of knowledge for its own sake, and all his admiration for the conquests over Nature by scientific men, yet the practical application of science to the relief of suffering was that object to which above all his own nature unceasingly gravitated.

It might be said that with Hunter devotion to physiological knowledge was a passion, and its practical application to surgery was looked on as part, which it truly is, of biological science. Brodie, from the first to the last of his long working life, from boyhood to old age, was keen set on his duties as a surgeon, and on the progress of whatever promoted the best interests of his profession.

Palmer has printed a characteristic letter of John Hunter's to Jenner, which Sir Benjamin, with all his mixture of playfulness and severity, would not have written :

"DEAR JENNER,—I have been long expecting a long letter from you, informing me of your method of curing ophthalmias, history of cuckoos, &c. I received your dogfish. Are you sure that the spawn or egg came from her? There was none in her. If it did, then there is a species of dogfish oviparous. Let me hear from you soon.

"Ever yours,

"JOHN HUNTER."

It is, moreover, certain that Hunter could not have pro-

duced the genially philosophic discussions imagined by the comprehensive, calmly-weighting spirit of the Physical and Psychological Inquirer. If you doubt this, read the first dialogue in the second part of the *Psychological Inquiries*, and afterwards peruse Palmer's account of Hunter bargaining at the alehouse for the body of the giant.

The object of these remarks, which might be illustrated at great length, is not to draw a contrast between two surgeons of St. George's, or rather surgeons of all time and of every place, but to show the young student that, whatever disputes he may chance to hear as to the amount of attention he should bestow on what men please to call respectively Science and Practice, these examples conclusively prove that it is neither by one nor by the other, but by something common to both, that the greatest success and the highest eminence are reached. Both the Science and the Art of healing were so blended in these men, that it is only by close inspection that we can presume to analyse their respective proportion in each. Blended indeed they were, yet producing different results. The men stand before us not unlike twin Alpine peaks which out-top the common range. Built of the same rock and covered with the same eternal snow, bathed in the same sunset, each mountain has yet its own character and hue. And only as we closely scan them we learn that these different characters and these varying hues come solely from the proportion and the directness with which the same whiteness and the same rock reflect the common light.

And what is the common light which gives the equal glow to the two so similar and yet so different men? The following passage, referring to the intentions which led Dr. Baillie and Sir Everard Home, both great anatomists and both attached to St. George's Hospital, to found the Hunterian Oration, will explain: "Distinguished themselves in the pursuit of science, they wished to direct subsequent generations into the only path by which scientific eminence is attainable. They wished to indicate the great truth that high excellence is beyond the reach of genius, unless that genius is combined with great industry, unwearied exertion, incessant application of every power of mind and of body. They wished to establish the conviction that the secrets of Nature, the hidden laws

which preside over its course, are not to be reached by conjecture alone, nor developed by an intellect pondering on the objects of its internal consciousness; but must be deduced from a study of Nature's works, from an observation of the phenomena which present themselves to the external senses, from the multiplication of experiments by which the deductions of reason may be verified or disproved. Still further, they wished to demonstrate that a true interpretation of Nature is not to be effected by a limited view of her operations; that the different branches of science are all subsidiary to each other; that as the whole universe was devised and called into existence by one Creative Mind, and is subjected to the perpetual guidance and direction of one Presiding Power, the unity of origin produces such an analogy in the different parts of creation, that they mutually explain each other, and will ever be best unravelled by him whose knowledge is most general, and whose views are most comprehensive.

“They thought that those great truths which philosophers and moralists have, from age to age, wearied themselves in demonstrating, would be displayed more fully and better in a living instance than by argument and precept; *more fully*, because they would be shown in practical operation, traced onward to their effects, with every action and every habit of life subjected to their influence; *better*, because in a form in which the feelings as well as the judgment would be interested, in which the admiration of genius and the sympathy with success would coöperate with the conviction of the understanding in prompting to similar endeavours and similar sacrifices.”

Such is the lesson of Hunter penned by a profound thinker and a Christian man, whom to know was to love, my revered teacher, George Babington, Surgeon to your Hospital. Let me add, such also is the lesson of Brodie.

These, then, are the models which St. George's holds up to us. Can we ordinary men reach them? If we cannot—and we cannot—what are the difficulties which stand between us and the attempt to catch the spirit which guided them?

We need not, of course, consider to-day the ordinary difficulties of forming habits of steady application, or the like.

We must assume them to be overcome. The heart and affections of the true Student are the same in all ages. The work alone varies.

We only then ask, what are the special present difficulties of the student ?

They seem to be, 1st, the great number of purely scientific facts, theories, and laws which are now more or less connected with Medicine, and must be more or less understood at some time, if not always remembered.

2d. The conflicting opinions which a student mixing with persons of different ages and different education will certainly hear, leading him to ask if there are any established opinions in Medicine.

3d. Want of clear perception in many persons that the one object of education in a medical student as such is to teach him to practise his art with safety and efficacy.

4th. A mistaken fancy that to be "practical," that is, to know "what he has to do, and to do it," is to be "unscientific," and so also discreditable.

Therefore, 5thly, a tendency to force upon the memory of the student a number of facts which are only indirectly relevant, which he cannot retain, and which serve no purpose of mental discipline.

The science and art of Medicine are in so rational and advanced a state, that it is as hard to compare them with the old knowledge of a century ago, as our mode of travelling now with the mode of travelling then. The difficulties just stated are quite exceptional, and will in a short time be mainly removed ; because they are understood and are fairly and openly met. They are those of a Transition Period. When we look back at any of the transition periods of former times, we, who are, as has been said, the real Ancients of the world, have the advantage of seeing from what points men started, what regions they traversed, where they were landed, and what mistakes they made on their way. You see this process crystallised in the architecture of many of our cathedrals. You see it on a great scale in the political convulsions which, in the Middle Ages and since, have vexed most European nations ; or in the circumstances which severed the now United States from the mother country. I will take a single

instance in Medicine. In an admirable discourse delivered not many years since, occurs the following passage: "I said that a prudent physician, called to a case of measles, will do little more than watch the progress of the disease when it progresses favourably, but if symptoms of pneumonia show themselves, and blood-letting is not resorted to at a proper period, the death of the patient may be the consequence of such neglect." You would probably not receive that advice now. Similar quotations from many authors might be made bearing on the treatment of many diseases, such as on the use of opium in delirium tremens, and more generally of alcohol.

It is useless to shut our eyes to these difficulties of a transition period—but they have occurred in previous ages of the world, when men were in some respects much less fitted to meet them than now. But these difficulties are only temporary, and they are generally the presage of greater strength for the persons and the age that overcome them. In quiet times, when difficulties are the fewest, fermentation is usually going on, mischief is accumulating, and at length an avenging explosion takes place to restore the average of good and evil, which is both our lot and the means of our progress.

Under these circumstances, the chief objects to be aimed at in training a medical student are, to teach him to see, to hear, and to touch with precision; to think with accuracy, and to be handy: *to see, hear, think, and be handy*, with respect to the subject-matters of his daily life.

Now, let us consider what these words mean.

There is a saying among the Italian artists, "That a man can see no more than he knows." Test this in our art, by a simple instance. A man in apparently good health is bathing with you. You happen to see that the veins may be somewhat larger in one arm than the other. To the ordinary eye this suggests nothing; indeed it is probably not noticed, and has not been observed by the possessor of the difference. The educated eye, transmitting this fact to the educated brain, evokes the desire to feel the larger vein. It is in one place hard. The owner believes the difference pointed out to be recent. The question of embolism is at once suggested, with all its terrible consequences of various diseases, and possibly sudden death in a manner formerly inexplicable.

The experience of every cultivated physician or surgeon will furnish endless instances of this suggestive physiognomy of latent disease—instances also where the same sagacity is required to detect that morbid phenomena, apparently of grave import, belong to the character of nervous affections. In all these cases this *seeing* is of course mainly a rapid intellectual process—brain-seeing as distinguished from sense-seeing—an instantaneous process of associative ratiocination. The gift, as it is called, and the extent of the gift, is not the result mainly of natural powers, but of previous attentive study, and retained knowledge which has been submitted to reasoning; which shows that training of the eye and the ear includes the habit of thinking logically. The main part then of self-discipline in this direction consists in learning to think correctly upon data which have been previously acquired, and to apply the conclusions with rapidity. This power is what is called common sense, which is the power of forming a rapid and correct judgment. When exercised on a high class of subject-matter, it constitutes the most important quality in our profession. It is often assumed by those who really have it not, and then the possessor of the spurious property is barred from all progress, and ceases to do good to himself or anyone else. In its genuine form it is noticeable in all our best men.

The student has not only to see, hear, and think correctly and quickly, but to “be handy.” Suppose, for instance, that (which perhaps you cannot suppose) a man were accomplished in every part of surgery, except in small matters of manual dexterity, could not thread needles, or saw a bone with a light hand—what a misfortune to him! For though a person who should pride himself chiefly on his manual dexterity would be a poor creature enough, we see at once that none of our great operators would be what they are unless they possessed this quality. It should be gained early. Putting up anatomical preparations for the museum is one of the most obvious, efficacious, and practically useful ways of acquiring parts of this habit of handiness and neatness. I only wish to add that this quality is valuable as much for the future physician as for the surgeon.

Lastly, you will observe that almost all which I have

described can be gained without books. This fact sometimes makes a feud between men who possess great learning, and those who rather value the rapidly applied sagacity which is obtained by observation and tact, and not by books. We have lately lost a splendid example of this kind of ready power in Sir William Lawrence. He may be named with high respect, because his mind was richly stored from sources other than his own; but he valued so highly and used so nimbly these practical powers, that his learning was concealed behind the playful keenness of his polished discourse.

As to the subject-matter on which you are to exercise these faculties, I must refer you to your excellent teachers. I venture, however, to say with regard strictly to *hospital* studies, that if you cultivate the habit of seeing and hearing everything that is to be seen and heard, from the kitchen to the house-top—that is, the administration of the hospital as well as treatment—of reflecting on what you see and hear, and of learning to be ready in doing small manipulative acts, be sure that so far you are using the hospital rightly.

You will perhaps allow a few words concerning the preparation for these special hospital duties. No one profited more by a careful education in boyhood than the great surgeon I have so often named, no one valued it more highly. In Sir B. Brodie's addresses, and in his Autobiography, you will find all that need to be, or indeed almost all that can be, said on those topics.

It is only now to be noted that schoolmasters have sometimes inflicted a cruel injustice upon their pupils by letting them pass into higher subjects when they were ill-grounded in a lower; for instance, letting bad English spelling and bad grammar pass, and so leaving a vexatiously weak point to gall their pupils in after life. But I hope those days are past. The young student must, however, now be sure that he receives adequate mathematical training, and acquires some facility in the use of algebra, geometry, and elementary mechanics—and for this reason, that mathematical formulæ and calculations are everywhere creeping into our departments. It may interest you to hear that Baron Bunsen, whose universal genius approached all subjects, and whose warm heart

made him give genial sympathy to men of all pursuits, walking towards this Hospital, and asking questions as to the teaching of physiology, remarked, to my surprise, "Biological problems will before long be constantly expressed in equations." This was in 1842. Now if you refer to any recent standard physiological work, you will see how rapidly mathematics are coming into use. That this must be the case more and more, is obvious, when you reflect on the manner in which pure physics are now connected with the study of vital function. I confess that I think there is danger here as elsewhere of heaping up knowledge useless to the practitioner. Nevertheless, for those who aim at any of the higher departments of our profession, the fact must be noted. Nor is it the case in physiological works only. You have but to consult the better and more modern works on diseases of the eye, such as that of Donders and those of his followers, to see that the pathology of that amazing zoophysical apparatus is necessarily bound to the mathematical physiology of light, as all pathology is necessarily bound to its correlative physiology. So also in the treatise on diseases of the heart by Von Dusch of Heidelberg, you will find many disturbances of the mechanical functions expressed in complex mathematical formulæ. So in the elaborate and admirable report on the cholera epidemic of 1866 by Dr. W. Farr, the laws of certain phænomena of cholera are expressed in equations. The elements of these equations are derived from ascertained laws in physics and chemistry, as they stand related to complex biological phænomena. You must therefore discard the notion that elementary mathematics are valuable for mental discipline alone. You may presently find them necessary for perfectly understanding some medical books.

If the attention of those who have time and means to devote to a complete education has been drawn to this subject, it is not to be supposed on this account that the use of mathematics is new in the history of medicine. The great physicians Borelli, Baglivi, and others, at the time of the impetus to learning in Italy during the seventeenth century, endeavoured to connect mathematics with medicine. In England, Pitcairne, with other able men, followed the same

course, attempting to define with mathematical exactitude many facts in physiology and pathology. It is right to add that these able men were well aware that their attempt belonged rather to the elucidation of the laws and the theory of the science, than to the practice of the art.

The past history of the mathematical school teaches us that much that bears directly on practice is not to be expected from this method, and that the ordinary student must not waste on abstract speculations the precious hours wherein under skilled guidance he can study the course of disease as it is spread before him in this great Hospital. The reason why mathematics will bring little direct fruit to practical medicine is that the difficulty of practice is to collect the data, from which formulæ after all must be constructed. The reasons why, this being so, they may not be neglected, are, that the appliances for bringing physics into relation with vital phænomena are now in a more advanced state than at any previous age; that mathematics tend to give precision to observation, to bring in the application of all available means of cognate physical research, to eliminate crude notions and vague assertions; and that here and there, as in the case of the eye, they lead to the discovery of important physical truths, which do bear directly on practice. *Mutatis mutandis*, these observations apply to other departments, and might be illustrated by them. Engineering, gunnery, and navigation may all be instanced.

There is another matter of a not dissimilar kind, on which it may be just now useful to the younger student if I say something—*Medical Nomenclature*. It is, as you all know, a law of the natural-history sciences that their existence and progress depend on correct scientific classification, as you may read in Mill's *Logic*, or in Whewell's *History of Scientific Ideas*. Classification demands correct definition, and this implies a precise name for the objects defined and classified. Take an instance. If one should say, "That man has a disease of the heart," it would convey to you a notion of what ails him about as clear as if he were to give as his friend's address, "Mr. Smith, Pimlico." We are placed differently from the public in this respect. They generally having no distinct idea either of anatomy, or of physiology,

or of disease, are more satisfied by the statement which conveys to you no idea than by the announcement that he has pericarditis, or has stenosis of the aortic valves.

The importance of definition is equally great for the sake of the physician and for the patient. In the instance of the contracted aortic valve (though even that definition is not precise enough for the purpose), the patient is exposed to one kind of danger, and one set of sequences. In the case of the pericarditis, he is exposed to another set, and exempt from the former. The chances of life are different, and the probabilities as to the course of the disease, to say nothing of the treatment, vary also.

Correct nomenclature has been retarded by the jargon of half-educated and inaccurate members of the profession in former days, and by the indiscriminating contempt which that jargon has brought upon accurate medical terminology.

It is desirable that the younger students should be aware of the present condition of medical nomenclature, since it will shortly affect the whole literature and language of our profession; and although the nomenclature to which I refer is itself in a transition state, yet the basis of a permanent one is certainly laid.

It is one chief scientific aim of medical classification to define all the injuries which can happen to the body. In order to do this with exactitude it is necessary that we should know, 1st, the nature and characters of all the component parts in their normal state, and then, 2d, the ways in which they can be altered, and the combinations of these alterations. Prior to the improvements in the microscope and to the advance of animal chemistry and physiology, this was manifestly a rude process; and to a certain extent is so even now. Some of the old classifiers, aware of this, selected symptoms as the ground of classification. For practical medicine this method had some advantages, but it was liable to errors past number.

It is not pretended that even now we know all the details of normal structure, still less that we know all their lesions, nor that we know completely the natural course of the lesions with which we are acquainted; and therefore no classification can as yet be completely made, with the exactness belonging

to some other parts of natural science. But medical nomenclature can be devised with so much simplicity and precision, that every term shall express a defined condition. The definition may be changed in conformity with the existing state of science, as its progress throws light on the abnormality to be defined. Terms so devised can be grouped into classes which violate no natural arrangements, chemical or physiological, with which we are acquainted; or into classes which have their basis in the causes of disease, or into other groups devised for special purposes. Such a careful system can be from time to time authoritatively improved with facility.

You are then beginning life, happily for you, with a wholly revised nomenclature of disease, as well as with a new key to the remedies in modern use.

The history of this nomenclature is both curious and important.

At the end of the sixteenth century "Bills of Mortality" were begun in the metropolis. They were prepared by the parish clerks, apparently to relieve the citizens from unfounded panics as to the extent of the Plague. The clerks seemed to have returned the causes of death of which they were cognisant in whatever form they thought fit. Their statistical tables are not less remarkable than might have been expected. Taking, for example, the year of the Great Plague, A.D. 1665, we find, comprised under sixty-three headings, all causes of death. Among these are 1258 chrismes and infants; 3 calentures; 2036 convulsion and mother; frightened, 23; head mould shot and mould fallen, 14; rising of the lights, 397; plannet, 6; surfeit, 1251; imposthumes, 227. It may interest you to know, by the way, that the returns of the Plague itself gave 68,596. This wild kind of nosological record not only existed long after the foundation of the College of Physicians and the life of Harvey, but continued in truth imperfectly modified until thirty years ago, notwithstanding all the progress of medical knowledge and of the various institutions in this country and on the Continent. In a letter to the Registrar-General, printed in the first volume of the Returns of his office, A.D. 1839, Mr. (now Dr.) Farr proposed a new classification for

the returns of the cause of death. This has since been amplified, and finally, after discussion at various European congresses, has been adopted by the principal countries of Europe. I cannot say what amount of debt this nation and the civilised world owe to Dr. Farr for his sagacity and industry in this department of social reform. Simultaneously, many eminent members of the English College of Physicians have with others been engaged for ten years in revising the nomenclature of disease. It is due to Dr. Sibson to say that this great labour fell for years mainly on him. You must be glad to think that your own Mr. Holmes and Dr. Barclay performed their full share of the important work. The result is a provisional Catalogue of Diseases in five languages. In this catalogue, under the great divisions of General Diseases, Local Diseases, Death dependent on Age, Poison, and Injury, 1146 abnormal states are named. This number does not represent the number of diseases, which are far more numerous, as the 1141st heading will show, where Ununited Fracture includes every bone capable of fracture, and liable to that condition; or the heading Hernia, 480, which includes under that number many conditions of that affection; and so of others. Nor are surgical operations, parasites, and congenital malformations included, they being all referred to an appendix. It is not easy for a beginner to appreciate either the value or the labour of this work. Indeed, I could imagine that when the student reflects on all this he may be almost deterred from beginning at all. In this case he must think of the advice of the old clock to the young one, who, complaining on his birth that he should never accomplish, as directed, $24 \times 60 \times 60 = 86,400$ ticks of his second's pendulum daily during his life, was admonished to try one at a time. The old clock ought to have added, "Do each one properly, otherwise the tick does not count, and you stop."

This new nomenclature will constitute a veritable epoch in the history of the causes, the modes of prevention and cure of the diseases of the human race; and will produce uniformity in description of disease throughout the world.

It may be noticed in most inaugural addresses that advice is given to the students as to their personal conduct. A Scotch professor, noted for his genius and his humour,

gives a catalogue of the improvements that may be looked for in medicine, when men shall travel by balloons in the air or by railways below the sea, when "all tiresome addresses shall no longer require to be written by old professors, nor listened to by young physicians." I assure you, in so far as addresses on personal conduct are concerned, I think that time is come. At all events, what should be said in general on that head has been nobly said by Brodie, in addresses that should be separately printed and given to every student that enters this Hospital. I therefore shall say nothing in that direction. I notice that the typical medical student is still sometimes by aged idlers held up to ridicule. By your conduct you will speedily live down this traditional trifling. At a time when vice and carelessness cankered society, the medical student was utterly neglected by the State. He does not owe his great improvement to its fostering care. For you endowments have done nothing, and you are free from State control. Do as you are doing, control yourselves.

Some of your difficulties (I began and I will end with them) are of a nobler kind. Professor Tyndall, in an address at Norwich which does him great honour, has put with the force and the clearness to be expected from him, some of the difficulties which attend a question you will necessarily have to meet, the relation of matter to mind. With that tender and humble manner which belongs to all true genius, Tyndall admits this relation to be inexplicable.

I therefore only add,

"Nocte premit Deus."

Do not for this reason, because you cannot know all, sullenly devote yourselves only to the study of the laws which regulate our material organisation. On the contrary, because, do what you will, you cannot unravel the whole mystery of your being, learn what you can of the nobler part of your nature. Be counselled by one who has seen not a little of the world, that if you must devote six days of your work to the study of your bodily frame, you should claim heartily the seventh for *yourself*. No student who seeks true cultivation should fail to have in hand some definite and weighty

study for this seventh day. Be not scoffed out of this by the scoffers. If one speaks lightly of these difficult questions, he betrays his incompetence to speak at all. But avoid all modern controversies. Read some of the manly teachers of the best period of our literature—Butler's discourses, for instance, on Human Nature. If such books as Grote's Plato, or those of Pascal, or Hooker, or Berkeley, or Locke, or Dugald Stewart, or Whately come in your way, read them. Depend on it that an hour with such strong men is like an hour of Highland air, which lifts you above the common cares of cramped and teeming life. From time to time read modern biographies of great men; read the lives of Arnold, Bunsen, and Romilly. In this way widen your interests with your fellow-men. While you remember you have to serve a profession of all the most jealous of half service, remember also there is none with so many sympathies.

* You will have vacations—become Littoral Zoologists or Geologists. Get a monograph of the Geological Survey (for a couple of shillings) of the Isle of Wight, and walk along the sections. This kind of enjoyment may be very inexpensive, will add a new zest to your life, make doubly pleasant what you know of comparative anatomy, and hinder you from taking narrow views of your own profession, or of any other. I have known some narrow-minded naturalists and scientific men, but I never knew a working man in any profession who, superadding a branch of natural history to his real work, was either narrow or self-sufficient. Do not make a business of recreation. It is one of the follies of the period, and leads to other follies. Of all exercises open to you, probably boating is the best, as well as the least expensive. Of course you all practise out-of-door sketching when you can—Sir Charles Bell, Seymour Haden, Prescott Hewett, Henry Monro, Chambers, and Solly have shown you the way; and if you do not follow, when you are older you will make bad diagrams, and will be worse lecturers than you might have been.

Among the refreshing changes of occupation sufficient attention has not been given to *handicraft*. At some period or other every youth intended for our profession should acquire the use of ordinary tools. If he could make for himself a plain cabinet with drawers, in which to keep his entomologi-

cal or botanical stores, his skill would have reached the full development of an amateur joiner. Few could bear this labour test, unless, like John Hunter, they had often been engaged in joiners' shops. The habit of acquiring knowledge and skill in boyhood and youth in manual arts leads to a certain intimacy with artisans. I would rather not just now seem to join in one of the fashions of the day, yet I cannot refrain from saying that in my boyhood I learnt much from trying to understand the ordinary mechanical work of our artisans. I would add, in my manhood, that I learnt nothing but good from these men. To become acquainted with skilled artisans and with their families; to know the actual difficulties of their work, and the moral force by which these difficulties are surmounted; to be able to appreciate accuracy in mechanical work,—are all in various ways advantageous to us in understanding afterwards our own profession, and therefore earnestly to be recommended to you.

Cultivate at all events social, cheery habits in all rational amusements. There is a certain possible pedantry of being a student, and an over-pride in staying at home, little conducive to an active and practical mind.

Lastly, if the student has difficulties, his lot is not singular, for the teacher has more. The method of medical teaching in England is undergoing revision. Caution is needed lest we root up wheat with the tares. At the beginning of the century the direct instruction in London was very limited in extent. Then circumstances made lecturing a profession. There were, fifty years ago, few books, but those few generally of value: now book-making has become a trade. Attending lectures about thirty years since became an intolerable evil, so now reading books, and being crammed in books, and examined in books, have become a fashion and a burden, which the combined action of the Metropolitan Teachers and the Medical Council will, I hope, ere long remove. Whatever these bodies wisely decide will be carried into effect by the Examining Boards.

An important point has not yet received sufficient attention, viz. what subjects should be taught at the hospitals. It is likely that no abstract rule universally applicable can be laid down. It might be expected that a hospital would

only teach what can be taught on sick people. There is no reason certainly why any portion of preliminary education should be given at a hospital. And had the Government of the country or the existing Universities paid timely attention to the needs of the nation, the idea of a hospital being the place for a complete medical school would never have arisen, and the practice would not have existed. A student should enter a hospital prepared to profit by it, and the hospital staff should be the judges of what preparation is desirable, and in what cases that preparation might be dispensed with.

If I may be allowed to express in a few words what has long appeared to me to be the proper theoretical arrangement, I should say this :

1. Institutions are required for preliminary education, general and scientific. Call these Universities, or "General and Scientific Schools."

2. Institutions are required for strictly clinical education. Call these "Hospitals and Clinical Schools." The former, the Universities, should both teach and examine in the subjects of general and scientific education, which are agreed upon between themselves and the clinical teachers. From the clinical teachers, that is the hospital staff, should be selected the examiners on the professional subjects. The small hospitals would hereby be utilised for their proper business, clinical teaching, and be relieved from the duty and expense of teaching all departments of physical science.

Further, provincial hospitals could be made part of such a scheme. It is quite conceivable that an arrangement might be entered into by metropolitan schools whereby house-surgeoncies, assistant house-surgeoncies, and resident physicianships and dresserships might be secured throughout the provincial hospitals, to the mutual advantage of those hospitals and the general clinical training of the profession. There is no provincial hospital now which cannot be reached from London in a few hours, and at small expense. Clinical opportunities might thus be greatly enlarged, and the provincial hospitals entirely relieved from what many cannot do properly, maintaining medical schools in the present sense of the term.

The organisation of the scientific schools is not, however, a simple matter. There is a tendency in modern teachers of science to demand of the average medical student an amount of acquirement which is at once unreasonable and unnecessary. A selection of subjects must be made; and, unpalatable as it may be to the democratic spirit, the principle sooner or later will be admitted that all men have not equal ability, that all practitioners cannot be perfect in every department, and that a system of pass and of honours is founded in reason and on fact. The Association of the London Medical Teachers will gradually elicit the truths concerning these general principles.

I do not here enter into the important question of Central Examining Boards; but I will only add, that it is just to student, to teachers, and to examiners, that a general consensus should be entered into without delay, as to what is to be learned and how, what is to be taught and how, and how far and by whom examinations are to be held. I have remarked elsewhere that I am at a loss to understand why the examinations in science, in medicine, and in surgery respectively, should not be held at different institutions for a common testamur, not only without inconvenience but with actual convenience and common benefit; adding this proviso, that those who are skilled in the practice of our profession must be allowed to put a veto on the extent of scientific examination required of the pass student. There are excellent observations on this subject in the Introduction to Medical Literature, published by one of the ablest men of the century, a physician to this Hospital, Dr. Young. The Medical Council, in consenting to postpone, what they would not indeed have been able to enforce, a knowledge of Greek as an absolute requisite preliminary to the recognised professional course of any member of our profession, has acted in the spirit of Dr. Young's sound observations, as to the limitation of our expectations.

We must never cease to remember two principles,—the first, that the able, well-disciplined, and industrious youths, such as it gives great pleasure to see nowadays holding dresserships in some of our hospitals, cannot be left too free to pursue their own bent in professional study. They should

be unhampered by any regulation except one,—that they should devote a certain number of years to the hospitals before their examination. I am old-fashioned enough to believe that *time* is an essential element in mastering an art. Secondly, that the average pass-man must be forced to direct his attention to certain essentials, which must be laid down by well-advised Examining Boards. The principle adopted several years ago, with respect to scientific examinations at Oxford, was based on these two rules,—a pass-man in natural science must pass in what is fundamental, in physics, chemistry, and general physiology; the honour student may apply himself to whatever special science he thinks fit, if he has passed in the three fundamental subjects. These simple regulations secure a general competency in the least-furnished student, and check the evil of a class of specialists, ignorant of the general relations of even their own department.

The Medical Council, as many here are aware, have lately applied to a large number of the principal teachers in the United Kingdom for their opinion as to the requirements of medical education and examination, not only in therapeutical, but in preventive and public medicine. It is to be hoped that a comparison with the attainments and methods of foreign schools will also be obtained. By this agency, information such as has never been collected will be laid before the public. It is sufficient to say that the work is in the hands of Dr. Parkes.

The labours of the London Teachers' Association will be lightened by these returns. I cannot name that body without adding that biological thought and progress will be largely influenced by them, and that the Address of their President, Dr. Simon, gives full promise that this influence will be used to the advantage of students, teachers, examiners, and the country.

Gentlemen, the history of any hospital, its growth, its necessities, have each their claim to attention. Students, teachers, sufferers, the public at large, all are interested in such ceremonies as those of this day—in the well-doing of a medical school. It has often been said, and may be said once more by me, that it fills with emotion an old pupil, when he

looks on benches filled with those who have yet to enter on the race in which he has run, who is called on to cheer them in their course, and to point the way. It fills him with manly pleasure to see his contemporaries, some once his fellow-workers and playfellows,—we, too, played and worked,—now the grave teachers on whose words you dwell, as we listened eagerly to a previous generation, as another race will one day listen to you; to see here more than one to whom he owes the debt you are now incurring,—

“The debt immense of gratitude,
 which a grateful mind
By owing owes not, but still pays, at once
Indebted and discharged,”—

the debt to our teachers, which we both can acknowledge and repay by a life of constant exertion and steadfast good-will.

The attention which is given, and increasingly given, by your Treasurer and your Committees to the hygiene of the Hospital, the erection of the Convalescent Hospital, the proposed reorganisation of the Nursing Department, and the affairs of the School, all give to the students opportunity for becoming acquainted not only with the technical treatment of disease, but with all those accessories of their profession which are necessary to the recovery as well as the comfort of the sick. Besides, a knowledge of these is now justly demanded of all members of our profession. Nor can I refrain from saying, that in after-life, when you look back on these golden opportunities, on the sick whom you visited, the knowledge you acquired, the friendships you formed, you will remember the days spent here as among the happiest of your lives. Make them so by the faithful use of every hour and all opportunity. Note day by day the uncomplaining gentle bearing of the sick poor, and the patient labour of those who wait on them. Besides the teaching of pure science and applied practice, you will thus learn useful lessons of conduct in your dealings with those among whom you will live. Do not despise these teachings. The accomplished and the strong should be too strong to despise the smaller virtues by which the rough ways of the world are made more smooth for the weak.

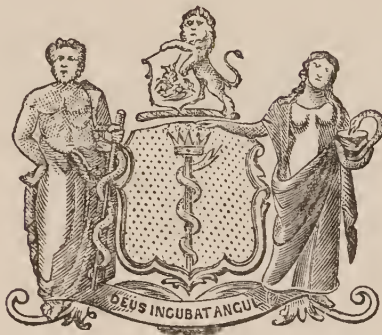
If you have been brought up to respect the faith which is

taught in the ministrations of the Hospital, carry away among your associations of hospital life, some with the hospital chapel, and the hospital chaplain, your common friend. If of other faith, then grudge not those who find a solace there. And lastly, look forward with cheerful confidence to your future life. Your happiness will not depend on the ambitions or the pleasures of the gay world, as you often see it from the windows or the steps of St. George's Hospital. Honest work will, it is true, with good health, secure you competence. But your chief pleasure will be in the acquisition of knowledge for its own sake, in conscious power to relieve much physical suffering, in fruitful striving after well-doing, and through the generous interchange, in every class of society, of pure unalloyed kindness between your fellow-creatures and yourselves.

END OF VOL. III.

ST. GEORGE'S HOSPITAL

Medical



School.

Session 1868-69.

THE WINTER COURSE OF INSTRUCTION WILL COMMENCE ON
THURSDAY, OCTOBER 1ST,

With an Introductory Address by DR. ACLAND, F.R.S., Regius Professor of Medicine at Oxford, at 2 P.M., at the Hospital.

MEDICAL OFFICERS.

Consulting Physicians.

Dr. WILSON ; Dr. BENICE JONES ; Dr. PITMAN.

Physicians.

Dr. FULLER ; Dr. BARCLAY ; Dr. JOHN OGLE ; Dr. WADHAM.

Assistant-Physicians.

Dr. DICKINSON ; Dr. WILLIAM OGLE.

Physician Accoucheur.

Dr. JOHN CLARKE.

Consulting Surgeons.

Mr. CÆSAR HAWKINS, F.R.S. ; Mr. CUTLER ; Mr. TATUM.

Surgeons.

Mr. PRESCOTT HEWETT ; Mr. POLLOCK ; Mr. HENRY LEE ;
Mr. HOLMES.

Assistant-Surgeons.

Mr. BRODHURST ; Mr. ROUSE.

Ophthalmic Surgeon.

Mr. HENRY POWER.

Dentist.

Mr. VASEY.

LECTURERS.		Mon.	Tues.	Wed.	Thurs.	Friday.	Sat.
<i>Winter Session.</i>							
Drs. FULLER and WADHAM.							
Clinical Medicine		2	..	..	..	..	..
Dr. JOHN CLARKE.							
Clinical Lectures on Diseases of Women . . . . .		..	..	..	2	..	..
Messrs. HEWETT and POLLOCK.							
Clinical Surgery . . . . .		..	2	..	..	..	..
Dr. BARCLAY.							
Principles and Practice of Physic		9	..	9	..	9	..
Mr. HOLMES.							
Principles and Practice of Surgery . . . . .		..	9	..	9	..	9
Dr. JOHN OGLE.							
Pathology and Morbid Anatomy . . . . .		..	..	..	3	..	..
Mr. HENRY POWER.							
Ophthalmic Surgery . . . . .		..	..	10	..	..	..
Mr. ROUSE.							
Descriptive and Surgical Anatomy		3	..	3	..	3	..
Dr. WILLIAM OGLE.							
Physiology and General Anatomy . . . . .		..	3	..	3	..	10
Dr. NOAD.							
Chemistry . . . . .		..	11½	..	11½	..	11½
<i>Summer Session.</i>							
Dr. BARCLAY.							
Clinical Medicine		2	..	..	..	..	..
Mr. HOLMES.							
Clinical Surgery . . . . .		..	2	..	..	..	..
Dr. JOHN CLARKE.							
Midwifery, and Diseases of Women and Children		9	..	9	..	9	..
Dr. DICKINSON.							
Materia Medica		3	..	3	..	3	..
Dr. WADHAM.							
Medical Jurisprudence . . . . .		..	9	..	9	..	9
Dr. BLANDFORD.							
Psychological Medicine . . . . .		..	..	3	..	..	..
Mr. BRODHURST.							
Orthopædic Surgery . . . . .		..	10	..	..	..	..
Mr. ROUSE.							
Operative Surgery . . . . .		..	..	..	..	..	..
Mr. VASEY.							
Dental Surgery . . . . .		..	10	..	..	..	..
Dr. CHILD.							
Botany . . . . .		..	3	..	3	..	3
Dr. BRIGHT.							
Comparative Anatomy		4½	..	..	..	4½	..
Dr. BARCLAY.							
Clinical Demonstrations of Diseases of the Skin . . . . .		..	..	..	2½	..	..
Dr. NOAD.							
Practical Chemistry		10	10	10	10	10	10

Medical Tutor.
Mr. EDGELOW.

I.

Gentlemen may become PERPETUAL PUPILS by paying a compounding fee of One Hundred Guineas. Perpetual Pupils are entitled to admission to the practice of the Physicians and Surgeons, to all the Lectures (except Practical Chemistry), to compete for all Prizes and Exhibitions, to hold the appointments of House-Physician, House-Surgeon, and Assistant House-Surgeon, and to become Clinical Clerks for two periods of three months each, and Dressers for two similar periods. This payment must in all cases be made at the time of entry.

II.

Gentlemen will be admitted to the Hospital Practice and Lectures required for the License of the Royal College of Physicians, for the Diploma of Member of the Royal College of Surgeons, and for the License of the Society of Apothecaries, with the exception of Practical Chemistry, on payment of the following fees, viz. Forty Guineas for the First Year of Study, Forty Guineas for the Second Year of Study, and Ten Guineas for each Succeeding Year. By payment of these fees, a Pupil is entitled to hold the offices of Clinical Clerk and Dresser, but not to become House-Physician or House-Surgeon, or to compete for the "William Brown Exhibition" and the "Clinical" Prizes. Pupils who have entered under this rule may at any time become Perpetual by making up their total payments to One Hundred and Ten Guineas.

III.

Gentlemen will be admitted to the Lectures and Hospital Practice required for the Diploma in Dental Surgery by one payment of Forty-five Pounds. This sum does not include Practical Chemistry.

IV.

Gentlemen may enter to the Hospital Practice and Lectures separately, on the following terms, viz. :

Hospital Practice.

	Six Months.			Three Years.			Perpetual.		
	£	s.	d.	£	s.	d.	£	s.	d.
Physicians' Practice . . .	8	8	0	16	16	0	25	4	0
Surgeons' Practice . . .	15	15	0	21	0	0	42	0	0

Attendance of the Physicians and Surgeons daily at One o'clock.
Surgical Operations on Thursdays at One o'clock.

LECTURES.

	One Course.			Perpetual.		
	£	s.	d.	£	s.	d.
WINTER SESSION.						
Descriptive and Surgical Anatomy	6	6	0	7	7	0
Physiology and General Anatomy	6	6	0	7	7	0
Chemistry	6	6	0	8	8	0
Medicine	6	6	0	7	7	0
Surgery	6	6	0	7	7	0
Pathology and Morbid Anatomy	5	5	0			
SUMMER SESSION.						
Materia Medica	4	4	0	5	5	0
Midwifery	5	5	0	6	6	0
Botany	3	3	0	4	4	0
Medical Jurisprudence	4	4	0	5	5	0
Practical Chemistry (including the use of apparatus and materials)	4	4	0			

Medical Tutor. The studies of the Pupils will be superintended by a Medical Tutor, who will hold periodical examinations of all the Students, and will especially devote himself to those who are preparing for examination for their Diploma. These examinations will be conducted three times a week, and each Student will pay One Guinea per annum for his assistance during the first three years of his attendance. A fee of Five Guineas in addition will be charged to those who desire to be instructed in the special subjects required for each examination at the University of London.

House Physician. This Officer is appointed annually, on the recommendation of the Medical School Committee, from among the Physicians' Perpetual Pupils. He has charge of half the patients in the Medical Wards, in the absence of the Physicians, and pays Fifty Pounds to the Treasurers of the Hospital for Board and Residence.

House Surgeons. The appointment to these offices is made half-yearly, on the nomination of the Medical School Committee, from among the Surgeons' Perpetual Pupils. The Pupil selected for this appointment is entitled to hold it for Twelve Months, on payment of Fifty Pounds to the Treasurers of the Hospital for Board and Residence.

Assistant House Physician. One of the Physicians' Perpetual Pupils is appointed for six months to aid the Assistant Physicians in prescribing for the Out-Patients. The tenure of this office will give a prior claim to the appointment of House Physician; and until a second House Physician is appointed, the Assistant may retain his office for a second term of six months, if approved by the Medical School Committee.

Assistant House Surgeon. One of the Surgeons' Perpetual Pupils is appointed half-yearly to attend in the Surgical Out-Patient Department. If his conduct be approved of, he will have the first claim to

the office of House Surgeon vacant at the expiration of his period of office.

Clinical Instruction. The Pupils of the Hospital requiring Certificates of Attendance on Hospital Practice will be divided into Classes, under the superintendence of the Physicians and Surgeons in rotation. The gentlemen forming these classes will be placed in charge of the cases as Clinical Clerks and Dressers under the direction of the Medical Officer to whom they are attached.

Ophthalmic Department. Persons labouring under Diseases of the Eye are seen twice a week as Out-Patients, and two Wards are reserved for cases of greater severity. A Course of Lectures on Diseases of the Eye is given, and the use of the Ophthalmoscope demonstrated from the cases under treatment.

Orthopaedic Surgery. The Course of Lectures on this subject will be illustrated by examples among the patients of the various classes of Deformities, and the methods employed for their relief.

Skin Diseases. Practical demonstrations from Patients labouring under these diseases will be given by the Lecturer on Medicine, in illustration of his course, when the students will be instructed in the means of diagnosis and the principles of treatment.

A Maternity Department, for the delivery of married lying-in women at their own homes, is established at the Hospital; and a Ward is devoted to the reception of women suffering under diseases peculiar to the sex, under the superintendence of the Obstetric Physician.

Obstetric Assistant. This officer is appointed annually by the Weekly Board and is eligible for reappointment. He resides and boards in the Hospital, receives a yearly salary of One Hundred Pounds, and must be a legally qualified practitioner.

Vaccination will be performed every Thursday morning at ten o'clock, and instruction in Vaccination given by the Obstetric Assistant.

Dental Surgery. Mr. Vasey will deliver a Course of Lectures on Dental Surgery during the Summer Session. Fee to Pupils (not being Pupils of the Hospital), One Guinea.

The **Library and Reading-Room** are open during the greater part of the day. Every Pupil of the Hospital has to subscribe the sum of Ten Shillings and Sixpence to the Library at the commencement of each Winter Session.

The **Museum** is open daily to the Pupils of the Hospital.

Curator. A Curator of the Pathological Museum is appointed annually by the Weekly Board from among the Senior Pupils, on the recommendation of the Medical School Council, with a Salary of Fifty Pounds per annum. One of the Pupils is appointed by the Medical School Committee to assist the Curator in performing Post-Mortem Examinations.

Registrars. A Medical and a Surgical Registrar are appointed annually by the Weekly Board from among the Senior Pupils, on the recommendation of the Medical School Council, each with a Salary of Fifty Pounds per annum.

Demonstrator of Anatomy. A paid Demonstrator will be appointed annually by the School Committee on the recommendation of the Lecturer on Anatomy, from among the Senior Students. In this appointment regard will be specially had to his acquaintance with the subject, and the manner in which he has conducted himself in the dissecting-room. He will assist the Pupils in their anatomical studies, and superintend the dissecting-room in the absence of the Lecturer.

REGULATIONS RESPECTING STUDENTS.

THE ATTENTION OF STUDENTS IS PARTICULARLY CALLED TO THE FOLLOWING REGULATIONS.

1. The Physicians' Perpetual Pupils are alone eligible for the office of House-Physician.
2. The Surgeons' Perpetual Pupils are alone eligible for the office of House-Surgeon.
3. All Pupils of the Hospital may become Candidates for the several offices of Medical and Surgical Registrar, Obstetric Assistant, Curator of the Museum, and Demonstrator of Anatomy. They are also entitled to attendance on the Maternity Department, and the Practice of Ophthalmic and Dental Surgery, without additional fee.
4. Certificates of attendance on Hospital Practice will not be signed for any Pupil who has not acted as Clinical Clerk and Dresser to the Physicians and Surgeons as may be from time to time required of him by the Dean of the Medical School.
5. Certificates of attendance on Lectures will not be signed for any Pupil who does not attend regularly and conduct himself with propriety.
6. At the beginning of every Session each Student must apply to Dr. BARCLAY, the Treasurer of the Medical School, or in his absence to Mr. HOLMES, the Dean of the School, for the Tickets required. The tickets—before they can be registered—must be taken to the respective Lecturers for their signatures.
7. The Schedules, as soon as procured from the College and Hall, should be brought to Mr. HOLMES, in order that they may be filled up in due course and signed by the respective Teachers. Students ought to apply to him for the Certificates of their past Courses of Lectures before entering on a new Session.

Attendance of Physicians and Surgeons at the Hospital.

Monday and Friday at 1 P.M. { Dr. BARCLAY and Dr. JOHN OGLE.
Mr. HEWETT and Mr. HOLMES.
Tuesday and Saturday at 1 P.M. { Dr. FULLER and Dr. WADHAM.
Mr. POLLOCK and Mr. HENRY LEE.

Out-Patients are seen on

Monday and Friday at 12 P.M., by Dr. WILLIAM OGLE and Mr. ROUSE.
Tuesday and Saturday „ „ Dr. WADHAM and Mr. BRODHURST.
Dr. JOHN CLARKE attends to see In-Patients on Tuesday and Saturday, at 1 P.M., and Out-Patients on Thursday, at 12 o'clock.
Eye-Patients are seen on Monday and Friday at 9 A.M., by Mr. POWER.

DENTIST.

Mr. Vasey attends at the Hospital on Tuesday and Saturday, at 9 A.M.,
and on Thursday at 1 P.M.

** * Further information may be obtained from Dr. BARCLAY, the Treasurer of the School, from Mr. HOLMES, the Dean of the School, and from any of the Lecturers, or Medical Officers of the Hospital.*

EXHIBITIONS AND PRIZES.**“The William Brown Exhibition”**

Of Forty Pounds per Annum, tenable for Three Years.

This Exhibition was founded by the Widow of William Brown, Esq., formerly a Pupil of St. George's Hospital, to be competed for by Perpetual Pupils, who have commenced their third but not completed their fourth Winter Session. It will be “bestowed on the Candidate who shall show the best general fitness for the exercise of the Medical Profession, and whose moral conduct shall in all respects be satisfactory.”

Sir Charles Clarke's Prize for Good Conduct.

Sir Charles Clarke, Bart., M.D., formerly a Pupil of St. George's Hospital, left the sum of 200*l.* Consols, the interest of which was to be awarded annually to the Student of the Hospital “who, by reason of his general good conduct during the preceding year, should be considered the most deserving.”

This Prize will be awarded by the Medical School Committee at the end of the Summer Session.

The Thompson Medal.

Mr. Serjeant Thompson, who was for many years Treasurer of St. George's Hospital, invested the sum of 100*l.* Three per Cent Stock, in the names of Trustees, for the purchase of a Silver Medal annually, to be awarded for the best Clinical Report of Medical and Surgical Cases observed in the Hospital during the preceding twelve months. The

cases are to be accompanied by observations, and are not to exceed twenty in each department.

Sir Benjamin Brodie's Clinical Prize in Surgery

Will be awarded to the Perpetual Pupil of the Hospital who shall have delivered to the Surgeons the best Report of not more than twenty Surgical cases which have occurred in the Hospital during the preceding twelve months, each case being accompanied with notes illustrative of its pathology, diagnosis, and treatment.

The Acland Clinical Prize in Medicine.

Dr. Acland, of Oxford, has offered for competition a Prize to the Pupil of the Hospital who shall produce the best record of not more than twelve cases of disease treated in the preceding twelve months. The record to be illustrated by drawings and diagrams when possible, and accompanied by physiological and pathological remarks in explanation of the treatment.

Competitors for the THOMPSON MEDAL and the CLINICAL PRIZES must send their Reports to the Secretary of the Medical School Committee on or before the 30th of June. The Reports must not have the name of the Candidate affixed, but must bear a motto on the outside, and be accompanied by a sealed envelope bearing the same motto, and containing his name and address.

The Henry Charles Johnson Memorial Prize in Anatomy

Will be awarded to that Pupil who shall, in the judgment of the Medical School Committee, exhibit the greatest proficiency in PRACTICAL ANATOMY.

The Examination for this Prize will be held at the close of the Winter Session.

General Proficiency Prizes.

At the close of the Summer Session a General Examination of all the Pupils will be held, when a CERTIFICATE OF PROFICIENCY will be given to each one who passes to the satisfaction of the Examiners, and the following PRIZES awarded to the most distinguished, viz.

TO PUPILS IN THEIR FIRST YEAR, TEN GUINEAS.

The subjects of Examination for the first year will be Anatomy, Physiology, Chemistry, and Botany.

TO PUPILS IN THEIR SECOND YEAR, TEN GUINEAS.

The subjects of Examination for the second year will be Anatomy, Physiology, Chemistry, and Materia Medica.

TO PUPILS IN THEIR THIRD YEAR, TEN GUINEAS.

The subjects of Examination for the third year will be Principles and Practice of Medicine and Surgery, Pathology, and Midwifery.

The names of those Students who pass the above Examinations will be published in alphabetical order, and the results of these Examinations and of those for the Clinical Prizes will be taken into account in appointing the House Physician and House Surgeons.

LECTURES.

The Winter Session commences October 1, and terminates March 31.

The Summer Session commences May 1, and terminates July 31.

Descriptive and Surgical Anatomy.

BY MR. ROUSE.

In these Lectures, the numerous parts and organs of which the human body consists are described with reference to their form and mutual relations, especially in their connexion with Surgery. Recent Dissections, Drawings, and Preparations are made use of for the purpose of illustration.

Physiology and General Anatomy.

BY DR. WILLIAM OGLE.

The structure and properties of the different tissues common to several organs are minutely described in this Course, as also the functions performed by those organs, either separately, or combined for a common purpose, and the laws which govern their actions.

These Lectures are illustrated by recent Dissections and Anatomical Preparations, and by Experiments and Diagrams.

Practical Anatomy.

Demonstrator of Anatomy, Dr. Whipham. Assistant Demonstrators, Mr. Christian and Mr. Byam. Demonstrator of Physiology, Dr. Bright. Demonstrations on Osteology will be given by Dr. Whipham. Demonstrations in Histology and the Elementary facts of Physiology by Dr. Bright.

A Fee of Three Guineas is charged to each Student requiring a Certificate, in order to provide subjects for dissection and meet the other expenses connected with the Dissecting-room.

Operative Surgery—Summer Session.

Pupils will have the opportunity to enter a Class under the superintendence of Mr. Rouse, who will assist and direct them in the performance of the various operations of Surgery.

Fee for the Course Four Guineas.

Comparative Anatomy.

BY DR. BRIGHT.

This Course of Lectures will be delivered during the Summer Session. The Course will have special reference to the Examinations of the Universities of Oxford, Cambridge, and London, and the Fellowship Examination of the Royal College of Surgeons. The Lectures, twenty-five in number, will be illustrated by specimens, preparations, and recent dissections.

Fee for the Course Four Guineas.

Principles and Practice of Physic.

BY DR. BARCLAY.

A general view of Symptoms in their relation to Disordered Function, and to Altered Structure, is given in this Course of Lectures ; and general facts and doctrines which have been ascertained and established are explained in so far as they serve as a basis for diagnosis or a guide in treatment. The Lectures will be illustrated so far as possible by specimens and preparations. The Diseases of the Skin will be demonstrated on patients affected by them. A portion of the course will be devoted to the subject of public health and hygiene as required by the College of Physicians.

Psychological Medicine.

BY DR. BLANDFORD.

Twelve Lectures on Insanity will be given, consisting of an outline of Psychology, with a description of the rise and Progress of Intellectual, Emotional, and Volitional Disorder ; the Causation of Insanity, its Varieties, Pathology, and Treatment. An exposition will also be given of the law of Insanity, certificates of Lunacy, and evidence in Medico-legal cases.

Candidates for the Membership of the College of Physicians are now examined in this subject.

Pathology and Morbid Anatomy.

BY DR. JOHN OGLE.

The course will include a general consideration of the nature of the various morbid actions set up in the body ; also the morbid anatomy of organs and tissues, and an inquiry into the condition of the secretions under the influence of disease. The history of tumours and morbid growths and the nature of the various concretions and degenerations which are met with will be considered, and the use of the microscope and of chemical re-agents in the investigation and diagnosis of disease will be explained and exemplified. The mode also of examining patients at the bedside, including the application of the stethoscope and other instruments in the examination of patients, and the proper manner of conducting post-mortem examinations will be treated of.

The course will be illustrated by drawings, diagrams, and models, and by specimens from the Pathological Museum ; also by recent specimens from the post-mortem room, furnished by the Curator.

Principles and Practice of Surgery.

BY MR. HOLMES.

These Lectures are intended to embrace an exposition of the principles on which the science of Surgery is founded, and also of the chief rules which govern its practice. Each Lecture will be illustrated by

cases in the Hospital and preparations from the Museum. The Pupils attending these Lectures will be examined practically at short intervals in diagnosis on the living subject, and in bandaging and minor Surgery. A course of demonstrations on the Laryngoscope will be given by Mr. Holmes.

Ophthalmic Surgery.

BY MR. HENRY POWER.

The Lectures on Ophthalmic Surgery will be delivered at 10 A.M. on Wednesday, throughout the Winter and Summer Sessions, and will include a systematic Course on the Diseases of, and Operations on, the Eye, with instruction in the use of the Ophthalmoscope. The Lectures, as far as practicable, will be illustrated by cases under treatment.

Orthopædic Surgery.

BY MR. BRODHURST.

These Lectures will embrace a description of the various forms of Curvature of the Spine, Contractions and Ankylosis of Joints, Club-Foot, and Congenital Deformities. They will be illustrated by cases selected for that purpose, and demonstrations will be given of the various means and appliances, surgical and mechanical, which are employed in their treatment.

Dental Surgery.

BY MR. VASEY.

A Course of Lectures on Dental Surgery will be given during the Summer Session.

Chemistry.

BY HENRY M. NOAD, PH.D. F.R.S.

These Lectures will be divided into three Sections.

The *First* will be occupied with a full consideration of the fundamental doctrines of Chemistry.

In the *Second* division, the materials of the Inorganic world, and their most important combinations, will be examined.

The *Third* division will be devoted to the Chemistry of the *Vegetable* and *Animal* kingdoms.

Practical Chemistry.

A commodious Laboratory has been arranged, and every requisite provided to carry into full effect the regulations of the Medical Corporations, requiring "a specific course of Instruction to be given in the Laboratory, with an opportunity of Personal Manipulation in the ordinary Processes of Chemistry, and of acquiring a knowledge of the various Re-agents for Poisons."

Fee for the use of Apparatus and Materials . . . Four Guineas.

Practical Pharmacy.

Gentlemen may be instructed in Pharmacy in the Laboratory and Dispensary of the Hospital.

Midwifery and Diseases of Women and Children.

BY DR. JOHN CLARKE.

These Lectures comprehend, *First*, the Anatomy, Physiology, and Pathology of the unimpregnated Uterine System; *Secondly*, a description of the Gravid Uterus; *Thirdly*, the Symptoms and Treatment of all the Varieties of Parturition; *Fourthly*, the Diseases of Puerperal Women; and *Fifthly*, the Diseases of Infants. Numerous Drawings and Engravings, and an extensive Museum, are used to illustrate these Lectures.

Pupils have ample opportunities of learning Practical Midwifery, under the superintendence of the Obstetric Physician, by attendance on married women lying-in at their own homes.

A Course of Clinical Instruction, and in the Winter a Course of Clinical Lectures, on the Functional and Organic Diseases of Women will be given, exemplified by cases admitted into the Ward set apart for women suffering under ailments peculiar to the sex.

Materia Medica.

BY DR. DICKINSON.

This Course embraces a consideration of all substances which are used as Medicines, arranged in Groups according to their chemical characters and their natural order. Their Physical and Chemical characters are described; the mode of detecting their Adulterations illustrated by Experiments; the principal operations of Pharmacy explained; and a few Lectures are devoted to the Theory and Art of Prescribing. An extensive collection of Materia Medica is open for the use of the Students.

Medical Jurisprudence.

BY DR. WADHAM.

The application of the Physiological, Medical, and Surgical Sciences to the elucidation of Legal Investigations, including Toxicology, is taught in these Lectures.

Botany.

BY DR. CHILD, F.L.S.

This Course comprises the Anatomy and Physiology of the Vegetable Kingdom, including an explanation of the Natural and Artificial Systems of Classification. Fresh and dried Specimens of Plants, with numerous drawings, are used to illustrate these Lectures, and Herborising Excursions are made during the Session. Microscopical Demonstrations are frequently given in the course of the Session.

REGULATIONS OF THE ROYAL COLLEGE OF PHYSICIANS.

Every Candidate for the College License shall produce satisfactory evidence—Of having attained the age of twenty-one years—Of moral character—Of having passed before the commencement of professional study a preliminary Examination in the subjects of General Education—Of having been registered as a Medical Student in the manner prescribed by the General Medical Council—Of having been engaged in professional studies during four years, of which *at least three winter and two summer sessions shall have been passed at a recognised Medical School or Schools, and of having attended during three winter and two summer sessions the Medical and Surgical Practice at a recognised Hospital or Hospitals; and of having been engaged during six months in the Clinical Study of Diseases peculiar to Women; the commencement of the period of professional Study will in future date from the registration of the Student by the Registrar of the Medical Council*—Of having studied the following subjects: Anatomy (with dissections) during Two Winter Sessions—Physiology, Two Winter Sessions—Chemistry, Six Months—Practical Chemistry, Three Months—Materia Medica, Three Months—Practical Pharmacy, Three Months—Botany, Three Months—Principles and Practice of Medicine (*it is desired that the study of the Principles and Practice of Medicine should comprise the study of the Principles of Public Health*), Two Winter Sessions—Morbid Anatomy (*including attendance and instruction in the Post-Mortem Room during the period of Clinical Study*), Six Months—Clinical Medicine, Two Winter Sessions and Two Summer Sessions—Principles and Practice of Surgery, Two Winter Sessions—Clinical Surgery, Two Winter Sessions and Two Summer Sessions (*by Clinical Medicine and Clinical Surgery are meant special study and instruction at the bedside, with Lectures on cases. Attendance on these Lectures must not commence until after the First Winter Session at a recognised Medical School*)—Midwifery and Diseases peculiar to Women, Three Months (*Certificates must be produced of attendance on not less than twenty labours, and of instruction and proficiency in Vaccination*)—Forensic Medicine, Three Months (*the Winter Session comprises a period of Six Months, and the Summer Session a period of Three Months*)—Of having passed the professional examinations. N.B. Blank Forms of the required Certificates may be obtained on application at the College.

The Examination is divided into two parts: the first comprises Anatomy and Physiology, and may be passed at any time after the termination of the Second Winter Session at a recognised Medical School. The second part embraces Surgical Anatomy and Surgery, Materia Medica and Chemistry, Medical Anatomy, Medicine (*including the Principles of Public Health*), and Midwifery. The Examinations

are held in the first and second weeks of February, April, July, October, and December. Fourteen days' notice in writing is required to be given to the Registrar of the College. Any Candidate who shall produce evidence of having passed an Examination in Anatomy and Physiology satisfactory to the College will be exempt from the first part of the Examination for the College License. Any Candidate who shall have obtained a degree in Surgery at a University approved by the College, or a Diploma from one of the Royal Colleges of Surgeons, after a course of study and examination satisfactory to the College, will be exempt from reëxamination in Surgical Anatomy and the Principles and Practice of Surgery.

Candidates for admission as Members of the College who have not obtained a Degree in Arts in a recognised University, or passed an equivalent examination prior to the commencement of professional studies, will be examined in the subjects of General Education by the President and Censors of the College.

They will be required to produce the following Certificates: 1. Of having attained the age of twenty-five years. 2. Of good moral character and conduct. 3. Of having been engaged during five years in the acquirement of professional knowledge, of which four at least shall have been passed at some recognised School or Schools. 4. Of having attended Medical Practice during Three Winter and Three Summer Sessions, and Surgical Practice during Three Winter and Two Summer Sessions of a Hospital containing at least 100 beds. 5. Of having attended Lectures on Clinical Medicine during Three Winter and Three Summer Sessions. 6. Of having attended all the other Lectures required of Candidates for the License.

Any Candidates who shall have passed an Examination in Anatomy and Physiology by any examining body recognised by the College will be exempt from reëxamination on these subjects.

Any Candidate who shall have obtained a Degree in Surgery at a University recognised by the College for this purpose, or shall have passed an Examination in Surgery at one of the Royal Colleges of Surgeons, after a course of study and Examination satisfactory to the College, will be exempt also from reëxamination in Surgical Anatomy and Surgery.

Any Candidate who has already obtained the Degree of Doctor or Bachelor of Medicine, at a University recognised by the College, shall be exempt (if the Censors think fit), from all or any parts of the Examination, except those on Medical Anatomy, the Principles and Practice of Medicine (*including the Principles of Public Health*), and on Psychological Medicine.

Every Candidate will be required to translate into English a passage from a Latin author, and he will have an opportunity of showing a knowledge of Greek, or of one or more of the European Languages.

REGULATIONS OF THE ROYAL COLLEGE OF SURGEONS.

Candidates for the Diploma of Member will be required to produce the following Certificates, viz. Of being twenty-one years of age—Of having been engaged during four years in the acquirement of professional knowledge—Of having studied Practical Pharmacy during three months—Of having attended Lectures on Anatomy during Two Winter Sessions—Of having performed dissections during not less than Two Winter Sessions—Of having attended Lectures on Physiology during Two Winter Sessions—Of having attended Lectures on Surgery during Two Winter Sessions, of which one Course must not be earlier than the Third Winter Session at a recognised Medical School—Of having attended one Course of Lectures on each of the following subjects, viz. Chemistry, Materia Medica, Medicine, and Midwifery—Of having attended at a recognised Hospital or Hospitals in the United Kingdom the Practice of Medicine, and Clinical Lectures on Medicine, during One Winter and One Summer Session—Of having attended at a recognised Hospital or Hospitals in the United Kingdom or Colonies the Practice of Surgery, and Clinical Lectures on Surgery, during Three Winter and Two Summer Sessions—Of having been instructed in Vaccination—Of having subsequently to the completion of two years' professional education taken charge of Patients under the superintendence of a Surgeon during not less than Six Months, at a Hospital, General Dispensary, or Parochial or Union Infirmary recognised for this purpose, or in such other similar manner as, in the opinion of the Council, shall afford sufficient opportunity for the acquirement of Practical Surgery.

N.B. Blank Forms of the required Certificates may be obtained on application to the Secretary, and all such Certificates will be retained at the College.

The Examination of Candidates for the Diploma of Member of this College will be divided into two parts: the first relating to Anatomy and Physiology; the second relating to Pathology, Surgery, and Surgical Anatomy. The Examination on Anatomy and Physiology will be held in the months of April, May, July, November, and January. The Examination on Anatomy will be on the recently Dissected Subject, and on prepared parts of the Human Body. Candidates for these Examinations are required to signify their desire of being admitted thereto not less than one month previous to the period of examination. Students will be admitted to the First Examination after they have completed the Second Session of their Anatomical Studies.

Candidates for the Diploma will be required to produce one or other of the following Certificates: Of Graduation in Arts at a recognised University—Of an Examination for Matriculation; or such other Examination as shall, in either case, from time to time, be sanc-

tioned by the Council of this College, at a University in the United Kingdom ; or at a colonial or foreign University recognised by the Council of this College—Of having passed the Preliminary Examination for the Fellowship of this College ; or of the Colleges of Surgeons of Ireland or Scotland ; or of the Faculty of Physicians and Surgeons of Glasgow ; or of the Society of Apothecaries of London ; or of the Apothecaries' Hall of Ireland ; or the first-class Examination of the Royal College of Preceptors.

Candidates who shall not be able to produce one or other of the foregoing Certificates will be required to pass an Examination in English, Classics, and Mathematics ; conducted by the Board of Examiners of the Royal College of Preceptors.

The following are the subjects of the Examination, viz.

PART I. Reading aloud a passage from some English author.—Writing from dictation.—English Grammar.—Writing a short English composition ; such as a description of a place, an account of some useful or natural product, or the like.—Arithmetic. No candidate will be passed who does not show a competent knowledge of the first four rules, simple and compound, of Vulgar Fractions, and of Decimals.—Questions on the Geography of Europe, and particularly of the British Isles.—Questions on the outlines of English History, that is, the succession of the Sovereigns, and the leading events of each reign.—Euclid, Books I. and II.—Translation of a passage from the first book of Cæsar's Commentaries.

PART II. Papers will also be set on the following seven subjects, and each Candidate will be required to offer himself for examination on one subject at least, but no candidate will be examined on more than four : Greek.—French.—German.—Mathematics.—Mechanics.—Chemistry.—Botany and Zoology.

This Examination *must* be passed before the commencement of Professional study. It is at present held in June and December.

The commencement of professional study otherwise than by attendance on Lectures in recognised Medical Schools, or by attendance on the Practice of recognised Hospitals, will not be admitted until a Certificate thereof shall be furnished to the Secretary for registration at the College by the Practitioner whose Pupil the Candidate shall have become, or by the Medical Superintendent of the Hospital or other Institution to the practice of which he shall have entered ; and will consequently date only from the reception of such Certificate by the Secretary, the Certificate to be accompanied by proof of having passed the necessary Preliminary Examination in General Knowledge.

Every Candidate for the Fellowship will, in addition to the compulsory subjects of the Preliminary Examination, be required also to pass in Greek, French, and Algebra, unless he can bring proof of being a Graduate in Arts of a University recognised by the College, or of having passed an Examination in Arts required for graduation in Medicine at a University recognised for this purpose.

Before admission to the First Examination for the Fellowship, every Candidate is required to produce Certificates of having attended Anatomy and Physiology with Dissections during three Winter Sessions of six months, one Course of Lectures on Comparative Anatomy and Chemistry, and a three months' Course of Practical Chemistry, at a recognised School, and of having studied Practical Pharmacy for three months.

Before admission to the Final Examination he will be required to produce the following Certificates : 1. Of being twenty-five years of age. 2. Of having been for six years engaged in the acquirement of professional knowledge at recognised Hospitals and Schools, or if already a Member of the College, of having been so engaged for two years, in addition to the time required for the Diploma of Member. 3. Of having attended the several Courses of Lectures required of Members, with the addition of Medical Jurisprudence. 4. Of having attended Lectures on Operative Surgery, and performed Operations on the dead body under the Superintendence of the Teacher. 5. Of having attended the Surgical Practice of a recognised Hospital during four Winter and four Summer Sessions, and the Medical Practice during one Winter and one Summer Session. 6. Of having been House Surgeon or Dresser for not less than six months, after the completion of two years' Professional Study.

A Candidate who shall have taken by Examination the Degree of Bachelor or Master of Arts at a recognised University will be exempt from one year of Professional Study.

A Candidate who shall have been eight years a Member of the College will be exempt from the Preliminary Examination and the first part of the Professional Examination, on production of a Certificate signed by Three Fellows, that he is a fit and proper person, and has been engaged for eight years in the practice of the profession of Surgery.

N.B. On and after the 1st of October 1868, all Candidates presenting themselves for the final Examination for the Diploma of Member of the College will be required to pass an Examination in Medicine at the College, or to produce a recognised Degree, Diploma, or License in Medicine, before receiving the Diploma.

REGULATIONS OF THE SOCIETY OF APOTHECARIES.

Every Candidate for a Certificate of Qualification to practise as an Apothecary will be required to produce Testimonials—Of having passed a Preliminary Examination in Classics and Mathematics before the commencement of Professional Study—Of having served an Apprenticeship or Pupilage of not less than five years to a Practitioner

qualified by the Act of 1815—Of having attained the full age of twenty-one years—Of good moral conduct—And of having pursued a Course of Medical Study in conformity with the regulations of the Court.

Every Candidate must attend the following Lectures and Medical Practice during not less than three Winter and three Summer Sessions: each Winter Session to consist of not less than six months, and to commence not sooner than the 1st nor later than the 15th of October; and each Summer Session to extend from the 1st of May to the 31st of July.

FIRST YEAR. *Winter Session*—Chemistry; Anatomy and Physiology; Dissections. *Summer Session*—Materia Medica and Therapeutics; Botany; Practical Chemistry.

SECOND YEAR. *Winter Session*—Anatomy; Physiology; Dissections; Principles and Practice of Medicine; Clinical Medical Practice. *Summer Session*—Clinical Medical Practice; Midwifery and Diseases of Women and Children, with attendance on Cases (not less than 20); Forensic Medicine and Toxicology.

THIRD YEAR. *Winter Session*—Principles and Practice of Medicine; Clinical Lectures; Clinical Medical Practice; Demonstrations of Morbid Anatomy. *Summer Session*—Practical Midwifery and Vaccination; Morbid Anatomy; Clinical Medical Practice.

A Preliminary Examination in Arts is held in January, April, and September, for the Examination of Students prior to Registration, who cannot produce a Certificate of having graduated in Arts, or passed an Examination equivalent to that required by the College of Surgeons.

The Examination of Candidates for a Certificate of Qualification to practise as Apothecaries will be divided into two parts.

First Examination, which may be passed after the Second Winter Session (provided the Candidate has completed the nineteenth year of his age), will embrace the following subjects: Latin, including the Pharmacopœia and Physicians' Prescriptions; Anatomy; Physiology; General and Practical Chemistry; Botany; Materia Medica.

Second Examination, after the Third Winter Session (the five years' pupillage being completed): Practice of Medicine and Pathology; Midwifery, including the Diseases of Women and Children; Forensic Medicine and Toxicology.

PRIZES AND SCHOLARSHIPS.

List of Students of St. George's Hospital who have distinguished themselves in the Annual Examinations.

AMESBURY, —.

1847-8.

ANDREWS, HEN. CHAS., London.

1852-3; and 1853-4.

ANNESLEY, J. C., Bengal Army.

1851-2; and 1852-3.

ANDERSON, R.

1863-4.

ANDERSON, W. J.

1844-5; and 1845-6.

ARDEN, H. A., Woodchester.

1840-1.

ARCHER, H. RAY, London.

1863-4.

ASH, W.

1856-7.

BABER, J., London.

1841-2.

BABER, E. C.

1867-8.

BALY, J. S., Kentish Town.

1839-40.

BANISTER, G., Bengal Army.

1839-40.

BARNES, E. G.

1866-7; and 1867-8.

BARNES, R., London.*

1840-1; and 1841-2.

BARRATT, J. G., London.

1839-40.

BARRETT, H.

1863-4.

BARTON, F. E., Dover.

1843-4; and 1844-5.

BATTEN, E. B.

1843-4; 1844-5; and 1845-6.

BELLAMY, GEORGE, R.N.

1854-5; and 1855-6.

BELLEW, H. W., Bengal Army.

1851-2; 1852-3; and 1853-4.

BELLEW, P. F., Bengal Army.

1851-2; and 1852-3.

BEVISS, CHARLES, Leeds.

1860-1; and 1862-3.

BISSHOPP, H., Haslemere.

1837-8.

BLAGDEN, J. A., Petworth.

1833-9.

BLAGDEN, R., Stroud.

1846-7.

BLENKINSOP, F. H.

1865-6.

BOLTON, R. T.

1849-50; and 1850-1.

BOWLES, R. L., Folkestone.

1853-4; 1854-5; 1855-6; and 1856-7.

BRAYBROOKE, W.

1840-1.

BRETT, F. C.

1864-5; 1865-6; and 1866-7.

BRIGHT, J. A.

1856-7; and 1857-8.

BROWN, J. B. S.

1844-5.

BUCKLE, H. B., Bengal Army.

1837-8.

BUDD, JAMES.

1842-3; and 1844-5.

BULLOCK, E., London.

1839-40; and 1840-1.

BULTEEL, CHRISTOPHER, Plymouth.

1851-2; and 1852-3.

BYAM, S. H.

1867-8.

* Obstetric Physician and Lecturer on Midwifery at St. Thomas's Hospital.

CAMPBELL, J.

1837-8.

CANT, W. E.

1863-4; and 1864-5.

CARTER, H. V., Bombay Army.

1848-9; 1849-50; and 1850-1.

CHAMBERS, T. K., M.D. Oxon.*

1839-40.

CHORLEY, W. F., London.

1838-9.

CHRISTIAN, J. G.

1866-7.

CLAPP, PRIDEAUX, R.N.

1860-1.

CLARKE, JOHN, London.†

1842-3; and 1843-4.

CLARKE, T., Banbury.

1841-2.

COE, R. W., Bristol.‡

1843-4.

COLLINS, J. C.

1843-4.

COLLISON, J. B., Bengal Army.

1852-3.

COLLYER, JAS., Minster.

1855-6; and 1856-7.

COOPER, G. F.

1855-6; and 1856-7.

COPESTAKE, T. G., Brailsford.

1846-7.

COPESTAKE, WALTER G., Derby.

1855-6.

CORNISH, W. R., Madras Army.

1850-1; 1851-2; and 1853-4.

COTTON, G. P.

1858-9.

COTTON, R. P., London.§

1837-8; 1838-9; and 1840-1.

COURTNEY, SYDNEY, Bengal Army.

1853-4.

COX, W. A.

1865-6.

CUNDY, OSBERT, London.

1837-8; and 1838-9.

DAY, FRANCIS, Madras Army.

1849-50; and 1850-1.

DAY, R. T.

1837-8.

DICKEN, PERRY, Ashby de la Zouch.

1837-8.

DICKINSON, W. H., M.D. Cantab.||

1851-2; 1852-3; and 1853-4.

DIXIE, W. F., Lutterworth.

1846-7.

DIXON, HENRY.

1847-8; and 1848-9.

DRIVER, G. V., London.

1842-3.

DRUITT, WM., Wimbourne.

1839-40; and 1840-1.

DUDFIELD, T. ORME, Kensington.

1858-9; 1859-60; and 1860-1.

DUKA, THEODORE, Bengal Army.

1851-2; and 1852-3.

DUKE, F. W.

1851-2.

DUNCAN, THOMAS, Richmond.

1851-2; and 1852-3.

EARLE, GEORGE, Newbegin.

1849-50.

EARLE, JOSEPH, Brentwood.

1848-9; and 1849-50.

EATON, JAMES, Grantham.

1856-7; and 1857-8.

EBSWORTH, A., London.

1842-3.

EDGELOW, T., London.

1862-3; and 1863-4.

EVANS, O. S.

1848-9.

* Formerly Physician to St. Mary's Hospital.

† Physician-Accoucheur to St. George's Hospital.

‡ Surgeon to General Hospital.

§ Physician to Hospital for Diseases of Chest, Brompton.

|| Assistant-Physician to St. George's Hospital, and to the Hospital for Sick Children.

- EWENS, JOHN, Milton Abbas.
1848-9; and 1849-50.
- FIELD, A. G., Brighton.*
1840-1; and 1841-2.
- FINCHAM, G. T., London.†
1839-40.
- FIRTH, W., H.M.S.
1850-1.
- FLETCHER, G. F.
1842-3; and 1843-4.
- FOLKARD, H., Bayswater.
1848-9.
- FOSTER, J. F., H.M.S.
1863-4.
- FOX, C. H., Bristol.
1856-7.
- FOX, E. L., Bristol.
1856-7.
- FREEBORN, R. F., Oxford.
1843-4.
- FULLER, H. W., M.D. Cantab.‡
1841-2.
- FULLER, W., London.
1844-5; and 1846-7.
- GARLAND, E. C., Yeovil.
1852-3.
- GEORGE, J.
1842-3; 1843-4; and 1844-5.
- GILLOW, W., Torquay.
1843-4; and 1844-5.
- GOODCHILD, F., Warwick.
1847-8.
- GOLDSMITH, G. P., Bedford.
1856-7.
- GRIFFIN, —.
1841-2.
- GRIFFITHS, S. H.
1839-40; 1840-1; and 1841-2.
- GUAZZARONI, J. B.
1843-4; and 1844-5.
- GUNDRY, J. S., Honiton.
1846-7.
- HALDENBY, W., Reedness.
1841-2.
- HALE, C., London.
1851-2.
- HARDING, EDWARD.
1854-5; 1855-6; and 1856-7.
- HARRISON, W., Skipton.
1850-1.
- HARRISON, G., London.
1856-7.
- HART, A. D., London.
1855-6.
- HASTINGS, C.
1847-8.
- HAWARD, J. W., London.
1862-3.
- HENERY, ED. T.
1839-40.
- HETT, H. N., Brigg, Lincolnshire.
1855-6; and 1856-7.
- HICKS, R., Baldock.
1845-6.
- HIGHMORE, W., Sherborne.
1837-8.
- HILBRIS, W.
1833-9.
- HOLL, H. B.
1845-6; and 1846-7.
- HOLLOWAY, J., H.M.S.
1844-5; and 1845-6.
- HOLROYD, W. S.
1865-6; and 1866-7.
- HOOVER, J. H.
1853-4.
- HOPE, WILLIAM.
1860-1.
- HOPKINS, G. H., Stone.
1842-3.
- HORNIDGE, T. K., London.
1847-8; 1848-9; and 1849-50.
- HOWSE, A.
1845-6; 1847-8; and 1848-9.

* Surgeon to St. Mary's Hospital, Brighton.

† Physician to Westminster Hospital.

‡ Physician to St. George's Hospital.

HUTCHINSON, T. C.
1837-8.

HUTTON, C., L.R.C.P., London.*
1837-8.

HUNT, ALFRED, Hammersmith.
1852-3.

HUNTER, G. Y., Madras Army.
1850-1; and 1852-3.

HUNTER, CHAS., London.
1853-4; 1854-5; 1855-6; and 1857-60.

ILES, F. H. W., Watford.
1852-3.

I'ANSON, T. F., Whitehaven.
1844-5; and 1845-6.

JACKSON, F. W.
1865-6.

JACKSON, E.
1865-6.

JANE, W., Newton Abbott.
1850-1.

JARVIS, R. F.
1840-1; 1841-2; and 1842-3.

JECKELL, P. B.
1850-1.

JOHNSON, ATHOL, Brighton.
1840-1.

JOHNSON, EDM., London.
1839-40.

JONES, C. H., M.B. Cantab.†
1840-1.

JONES, H. B., M.D. Cantab.‡
1837-8; and 1838-9.

KEENE, J., Hammersmith.
1852-3; and 1853-4.

KENYON, G. A.
1864-5.

KENYON, J. E.
1864-5.

KERR, J.
1847-8.

KING, GEORGE, Calne.
1846-7.

KINGSLEY, G. H.
1841-2; and 1842-3.

KITTOE, K.
1833-9.

KNIGHT, A. P., R.A.
1852-3; and 1853-4.

LAKE, G. R.
1866-7.

LAKING, F. H.
1864-5; 1865-6; and 1866-7.

LANDON, H.
1845-6.

LANGHORN, JOSEPH, London.
1860-1.

LEE, H., London.§
1837-8.

LEE, FRED. F., Salisbury.
1859-60.

LEIGH, W., London.
1863-4.

LEWIS, H., Rickmansworth.
1852-3; 1853-4; 1854-5; and 1855-6.

LICHFIELD, W.
1848-9; and 1849-50.

LLOYD, A.
1838-9; and 1839-40.

LLOYD, J.
1845-6.

LLOYD, N. H., Truro.
1860-1.

LOMAX, W. J., Lincoln.
1839-40.

LOVEGROVE, T. H.
1864-5; and 1866-7.

MCCONNELL, J. F.
1865-6.

MACKAY, A. D.
1852-3.

* Physician-Accoucheur, General Lying-in Hospital.

† Physician to St. Mary's Hospital.

‡ Consulting Physician to St. George's Hospital.

§ Surgeon to St. George's Hospital.

- MAGRATH, M., R.N.
1855-6.
- MALTON, C.
1844-5.
- MANNING, FREDERICK N., R.N.
1857-8; 1858-9; and 1859-60.
- MARLEY, R., Broomyard.
1844-5.
- MARSHALL, E. J.
1852-3; and 1853-4.
- MARTIN, E., Weston-super-Mare.
1843-4.
- MAYNE, T. H.
1846-7.
- MERRIMAN, J. J., Kensington.
1847-8.
- MILLER, MICHAEL.
1867-8.
- MITCHELL, JAS. I., Bath.
1843-4.
- MORGAN, JOHN, London.
1839-40; and 1840-1.
- MORRIS, C. J., Edmonton.
1848-9.
- MOSELY, A., London.
1856-7.
- NAYLER, G., London.
1850-1; and 1851-2.
- NICHOLAS, E., London.
1855-6.
- NICHOLLS, J., Wiveliscombe.
1851-2.
- NORMAN, A. B.
1867-8.
- NORMAN, GEORGE.
1865-6; and 1866-7.
- NOURSE, W. E. C., Brighton.
1839-40; and 1840-1.
- OGLE, JOHN W., M.D. Oxon.*
1847-8.
- PAGE, W. IRVING.
1859-60.
- PARKER, J. H., Whitechurch.
1846-7; and 1848-9.
- PARNELL, L., London.
1844-5; 1845-6; 1846-7; and 1847-8.
- PARRY, H. H., Allington.
1855-6; and 1856-7.
- PENNY, J., Madras Army.
1850-1; 1851-2; and 1852-3.
- PHILIPE, E. H.
1843-4.
- POCOCK, W., London.
1833-9; and 1839-40.
- PODE, C. C.
1864-5; 1865-6; and 1866-7.
- POLLOCK, GEORGE D.†
1837-8; and 1839-40.
- POLLOCK, H.
1849-50.
- POMERY, J. R.
1851-2.
- POPE, T. R., Hastings.
1840-1.
- PRYTHERCH, J. D., H.M.S.
1853 4.
- RICHARDSON, H. W. H.
1833-9.
- RING, E. C.
1864-5; and 1865-6.
- ROBERTS, C., Dunster.
1852-3; and 1853-4.
- ROBERTS, CHAS., York Dispensary.
1856-7; and 1857-8.
- ROBERTS, W. P., London.
1844-5; 1845-6; and 1846-7.
- ROGERS, G. G., London.
1852-3.
- ROGERS, GEORGE L.
1856-7.

* Physician to St. George's Hospital.

† Surgeon to St. George's Hospital.

- ROSS, J. T. C., Bengal Army.
1843-4.
- ROUSE, JAMES, London.*
1846-7; and 1848-9.
- ROWLAND, E. R.
1867-8.
- ROYSTON, C., London.
1849-50; 1850-1; and 1851-2.
- SANDON, J. H. B.
1842-3; and 1845-6.
- SEATON, DANIEL, Oakham.
1858.
- SIMS, FRANCIS M. B.
1863-4; and 1865-6.
- SMITH, R. J.
1837-8.
- SMITH, T. H., London.
1842-3; 1843-4; and 1844-5.
- SMITH, HEYWOOD, M.A., M.B.
Oxon.†
1862-3; and 1864-5.
- SOLTAU, W. F.
1837-8.
- SPACKMAN, W., Wolverhampton.
1841-2; and 1842-3.
- SPITTA, R. J., Clapham.
1837-8; 1833-9; and 1839-40.
- STEVENS, W. B., R.N., Plymouth.
1843-9; 1849-50; and 1850-1.
- STRONG, H. J., Croydon.
1852-3.
- SUTTON, WM., Dover.
1853-4; 1854-5; and 1855-6.
- SYMES, J. G., Dorchester.
1845-6.
- TATE, F. S., Louth.
1841-2.
- TAYLOR, JOHN, Bayswater.
1837-8.
- TEGART, ED., London.
1841-2; and 1842-3.
- TEPPER, JOHN, London.
1860-1; and 1861-2.
- THOMPSON, W., London.
1846-7.
- TINDALL, W. R.
1863-4; and 1864-5.
- TOMLINSON, G. D., H.M.S.
1856-7.
- TRIMNELL, G. F.
1845-6.
- UNDERHILL, F. W., Tipton.
1863-4; and 1864-5.
- UWINS, H.
1840-1.
- VENNING, EDGCOMBE, 1st Life
Guards.
1855-6; and 1857-8.
- WADHAM, W., M.D., London.‡
1844-5.
- WALFORD, W. G., Hertford.
1859-60.
- WALKER, EDWARD, H.M.S.
1855-6; and 1856-7.
- WALKER, G. E.
1867-8.
- WASBROUGH, R., M.D., Westbury.
1837-8.
- WATKINS, R. W., Towcester.
1841-2.
- WATSON, G. S.
1862-3; 1863-4; and 1864-5.
- WELLS, EDWARD, M.D., Oxon.,
Reading.§
1833-9; and 1839-40.
- WHITE, ARTHUR, London.
1839-40.
- WILLIAMS, W. J.
1849-50; 1850-1; and 1851-2.
- WILLIS, J. H., Lewdown, Devon.
1851-2; and 1852-3.
- WILSON, J. H. P.
1866-7.
- WOODCOCK, E. W.
1842-3.
- WOOLFEYS, I. A.
1844-5.
- WOOLMER, S. E., London.
1853-4.
- WYNDOWE, S. J., Madras Army.
1850-1.
- WYNTER, H. B.
1857-8.

* Assistant-Surgeon to St. George's and the Ophthalmic Hospitals.

† Assistant-Physician to the Hospital for Women.

‡ Physician to St. George's Hospital.

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